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DIESEL RAILWAY TRACTION SUPPLEMENT

The April issue of THE RAILWAY GAZETTE Supplement, illustrating and describing developments in Diesel Railway Traction, is now ready, price 1s.

TO CALLERS AND TELEPHONERS

Until further notice our office hours are: Mondays to Fridays, 9.30 a.m. till 5.30 p.m.
The office is closed on Saturdays

ANSWERS TO ENQUIRIES

By reason of staff shortage due to enlistment, we regret that it is no longer possible for us to answer enquiries involving research, or to supply dates when articles appeared in back numbers, either by telephone or by letter

ERRORS, PAPER, AND PRINTING

Owing to shortage of staff and altered printing arrangements due to the war, and less time available for proof reading, we ask our readers' indulgence for typographical and other errors they may observe from time to time, also for poorer paper and printing compared with pre-war standards

"London School of Economics at its Worst"

THE least unsatisfactory feature in a Budget which was the most political in its compilation ever to have been laid before the British Parliament, was the announcement that the Excess Profits Tax is to be repealed at the end of this year. That concession, however, is hedged about with uncertainties as to the impost which the Chancellor will put in its place, and, coupled with his vague admonition to industry, it can lead only to an increase in the uncertainty which already restricts business expansion. To say, as he did, that he would be guided in his decision as to the imposition of new taxation on profits or excess dividends by the conduct of private enterprise, without giving any indication as to what line he wished industry to pursue, places industrialists in a most unfair position. The Chancellor, in both his speech to the House of Commons and his broadcast address on the Budget, made it all too clear that he was concerned solely with sectional class interests. Practically every item of concession in his Budget was destined to appeal to the lower-income groups; his higher estate duties will increase the rapidly with which large estates are disintegrated and extinguished. The present Chancellor of the Exchequer cannot plead ignorance of the effects of the measures he has introduced. His Budget is a demonstration of the bright pink of the London School of Economics at its worst. It will not assist the outstanding national need of the times—incentive to enterprise and greater productivity.

Decline in Railway Revenue

At the time of going to press the Government White Paper giving the results of the pooled revenue and receipts and expenses of the controlled railway undertakings for 1945 are still awaited. From the White Paper on national income and expenditure of the United Kingdom which was issued at the end of last week, however, it is clear that there has been a very heavy fall in the net revenue of the pool during last year. A table showing the composition of the Central Government revenue for 1945 includes only £32 millions as receipts under the railway agreement. This compares with £49 millions for 1944, £54 millions for 1943, £66 millions for 1942, and £10 millions for 1941. It would appear therefore that net receipts of the pool before deduction of the £43½ millions payable as rental of the companies was of the order of £75½ millions. This figure probably will differ from that shown in the White Paper relating to the accounts of the pool, for the figures given in the Central Government revenue do not accord with those shown in previous pool accounts. Nevertheless, allowing for these variations it seems clear that the pool account will show a decline of perhaps £25,000,000 to £30,000,000 as compared with 1944.

Government Spokesmen Disagree

From the viewpoint of the progress and rehabilitation of British industry one of the most disquieting features of the present Government is the manner in which those who should be its authoritative spokesmen, proclaim divergent policies. The transport industry already has had experience of this. It has been told that British internal transport is to be nationalised, and it has also been informed that it is up to the nationalists to prove their case, and to the anti-nationalisers to do likewise. No indication has been given, however, as to how nationalisation is to be effected, nor, on the other hand, has there been any indication that the Government will attempt to prove the case for national ownership of transport, or permit the industry to prove its case against such a policy. Last weekend there was a further demonstration of Government contradiction. In the House of Commons on Friday, Mr. Arthur Woodburn, Parliamentary Secretary to the Ministry of Supply, assured the motor-car industry that the Government did not intend to tell it how to run its business and that it would be content to assist private enterprise to help itself. On the next day Mr. Emanuel Shinwell, Minister of Fuel & Power, used the motor industry as a peg on which to hang what he described as "a plain warning" to private industry. He said the Government did not wish to nationalise every industry in the country—at any rate not at present—"but they had better be warned." If they could not deliver the goods, the Government would do so. This was perhaps a particularly strange declaration by the Minister of Fuel

& Power, who is administering an industry which is already under Government control, and is shortly passing to State ownership. The success with which the mines are "delivering the goods" is a matter on which considerable doubt has been expressed.

Control of Iron and Steel Industry

Another major industry, the control of which seems to be exercising the minds of the Government, is iron and steel. Here again, it has been stated by a member of the Government that the industry is to be nationalised, and by another that a decision is in abeyance pending the consideration of the industry's plans for re-equipment and modernisation. That plan has been before the Government for some time, and if numerous circumstantial reports are to be believed, the Cabinet is divided on the steps it should take. It is suggested that for political reasons complete nationalisation of industry is still advocated by some members, whereas others, appreciating the complexity of the industry, would be content either with an overriding board of control, or with the acquisition of the basic steel-making plants. Meantime the industry is unable to proceed with many essential works which are part of its rehabilitation plan, and the efficiency not only of that industry, but of the many others which are dependent on it, inevitably must suffer. Probably one of the greatest factors retarding industrial recovery in this country at the present time is the widespread uncertainty among industries as to their future relationships with the State.

Accounts of Nationalised Industries

On a number of occasions we have referred to the paucity of statistical information relating to the railways which has been forthcoming during the period of Government control, and especially since the end of the war removed the need for secrecy on grounds of security. In the discussion of the Coal Bill in Standing Committee, unsuccessful efforts have been made to induce the Government to agree to the inclusion in the Coal Board's annual reports of full production figures, with district and national totals, as well as the total cost of production and the proceeds and profits of ancillary activities. The impression is gaining ground that the Government does not intend to be obliged to divulge figures which are essential if the public is to be able to form an intelligent opinion on the operation of State-owned industry, and if Ministerial and departmental inefficiency arising from accounting evasions and omissions is to be brought to light. If an appraisal of the results of national control and operation of basic industries is to be wellfounded, the maximum information must be available to the public which, in effect, will replace the stockholders of the former companies. The present Government, which has accepted the Cohen Committee report relating to companies operating under private enterprise, seems reluctant to adopt similar measures in respect to its own affairs.

Overseas Railway Traffics

There has been a total decline of ps. 276,000 in Buenos Ayres & Pacific receipts in the two weeks ended March 30, although the company is still ps. 4,195,000 ahead of the previous year. The largest gains during the fortnight have been on the Buenos Ayres Great Southern, totalling ps. 937,000, but the best aggregate improvement to date is shown by the Central Argentine, which recorded a total increase of ps. 865,310 in the past two weeks. Entre Rios traffics showed an increase on aggregate of ps. 1,215,700 at the end of the 39th week. Figures for the past fortnight are shown in the following table:—

	No. of week	Weekly traffics	Inc. or dec.	Aggregate traffic	Inc. or dec.
Buenos Ayres & Pacific*	39	2,482	—	88,604	+ 4,195
Buenos Ayres Great Southern*	39	4,561	+	138,530	+ 7,597
Buenos Ayres Western*	39	1,153	+	46,582	+ 2,481
Central Argentine*	39	3,408	+	123,026	+ 9,877
Canadian Pacific	13	1,581,600	—266,000	14,232,000	— 494,400

* Traffic receipts in thousands of pesos

Canadian National earnings were £808,200 behind the previous year at the end of February, compared with a decline of £268,200 on the Canadian Pacific.

New Motive Power Depot at Carnforth

Ten years ago the L.M.S.R. drew up plans for the provision of a new motive power depot at Carnforth on the site of a former Furness Railway shed which was demolished for the purpose. War delayed the completion of the project. A few months ago, however, employees of the two existing Carnforth depots were transferred to the new premises, and the old L.N.W.R. and Midland sheds were closed. As a result of this move it is expected that considerable economies will be effected and the working of traffic facilitated. In the new shed, which is described and illustrated elsewhere in this issue, there are independent entrance and exit roads; the shed is of the through type with six roads and engine repair pits. Arrangements are in hand for two of the repair pits to be equipped with fluorescent lighting in the pit walls and for fluorescent lighting trolleys to be supplied for the external examination of engines. Modern equipment throughout will ensure a quick turn-round of engines. The water supply passes through a water softening plant before being pumped to the main storage tank, and the coaling plant bunkers are supplied with jigger feeds to both coaling roads, so that passenger or freight engines can take the appropriate grade of coal.

Home Railway Traffics Decline

The return of traffic receipts for the four main-line railway companies and the London Passenger Transport Board for the four weeks ended March 24, shows a decline in all classes of traffics as compared with the similar period a year ago, although as compared with the corresponding period of 1939 there is an increase under all heads. The comparative details, and also those relating to the aggregates for the first twelve weeks of 1946, 1945 and 1939, are given in the table below:—

FOUR WEEKS ENDED MARCH 24, 1946						
	1946	1945	Decrease		1939	
	£000	£000	£000	%	£000	£000
Passengers	13,258	14,157	899	6.3	6,626	6,626
Merchandise	8,296	11,767	3,471	29.5	4,282	4,282
Coal and coke	3,833	3,971	138	3.4	2,816	2,816
Total	25,387	29,895	4,508	—	13,724	13,724

AGGREGATE FOR THE TWELVE WEEKS OF THE YEAR						
	1946	1945	Decrease		1939	
	£000	£000	£000	%	£000	£000
Passengers	39,610	39,930	320	0.8	19,521	19,521
Merchandise	23,932	31,094	7,162	23.0	11,821	11,821
Coal and coke	10,979	11,132	153	1.4	8,636	8,636
Total	74,521	82,156	7,635	—	39,978	39,978

The figures show that the decline in railway traffics is increasing, and studied in connection with the details given in the White Paper on the operations of the pool for 1945, given elsewhere in this issue, they would suggest that the decrease in net receipts is likely to be greater than the decline in gross traffics. The falling off in both passenger and goods traffic probably reflects in large part a further shrinkage in movement of military personnel and freight.

How New Industries Arise

A new industry does not as a rule grow out of an existing organisation. It is usually started by some enthusiast who believes in the commercial and industrial possibilities of his idea and whose first problem it is to secure the confidence of his colleagues and persuade them to spend money on the venture. Neither is it possible nowadays for an economic investigation of market conditions and production costs to prove conclusively that a new industry is possible. Either there is a market already, in which case the manufacturer must decide whether the new product will be a success by being cheaper than the existing one or by being an improvement on it, or there is no market yet in being, when he has to decide whether a new market can be created. These points were brought out by Dr. R. E. Slade in his paper, which is summarised elsewhere in this issue, to the recent conference organised by the Federation of British Industries. This country has often provided the ideas on which other countries have built industries, but we have done less than our share in turning these ideas to our own account, probably because only recently have we adopted scientific industrial methods, and as a nation hardly realised the need for science and research in industry until the first world war. A research laboratory may give rise to new

industries in a number of ways. Research may be directed to supplying a well-defined want, or it may produce ideas which create a new kind of want. Sometimes it succeeds in lowering cost of production to such an extent that the use of an article is considerably extended, or it may produce a new device or a new chemical. To accomplish this we have the research men, the technical men, and the business men, and all we need now is the pioneering spirit in every firm, large and small.

Main-Line Electrification

In the past many comparisons have been made between the various possible methods of electrification envisaged for main-line railways. On the continent it has been decided, as was shown in our March 29 issue, that the low-periodicity single-phase a.c. method outclasses all others; here, on the contrary, and in America, there seems to be a distinct preference for the d.c. method. The matter cannot be regarded as settled and in the meantime technical advances affect the position by sometimes conferring a fresh advantage on the first method, at other times on the second. Equally far from final solution are the mechanical problems involved. Continental practice, for which there is considerable scientific justification, favours a high position for the driving motor; this is wholly supported on the main frame and transmits power through a quill or other form of flexible drive. Generally, the power is built into separate locomotives. In this country axle-hung motors find wide application in the multiple-unit type of train. Though offering advantages, the latter arrangement does not tend to smooth riding at high speeds, nor is it conducive to a long life for the track.

Electric Crossing-Gate Lights in India

The provision of a suitable night warning to indicate to road users that level crossing gates are closed, for many years was accomplished satisfactorily by applying an ordinary oil-lighted lamp, and before motor vehicles became common little more was required. This arrangement has continued in use, with special types of lamp on occasion, as when the relative position of gates and road approaches renders a wide range of light beam essential, the ordinary bull's-eye not covering a sufficient angle to provide an adequate stop sign to vehicles. The oil lamp is independent of a power supply, which is not to be had at many locations, but where electricity readily is available, it is possible to improve the power and range of the gate warning lights, and even to incorporate a change of aspect with them. At certain places in this country the ordinary standard road traffic lights have been applied to crossings with success. The problem has attracted attention in India, where road traffic is on the increase, and we publish elsewhere an article by Mr. H. C. Towers, Signal Engineer, B.B. & C.I.R., Ajmer, describing the application of red and white electric gate lights, when necessary using specially constructed lanterns, so directed as to provide the maximum visibility along the road approaches and reduce to a minimum the chance of the closed gates being overlooked, whilst ensuring that the red light shows until everything is safe for vehicles to pass.

Conversation in the Carriage

Criticism of passengers who chatter in trains often comes from those who claim that other person's conversations interrupt their thoughts. The profound thinker takes time off from his speculations in the hope of catching where it is that a talkative neighbour buys his whisky, or what was the condition of the motorcar he saw through a gap in the hedge at a Government dump. At the critical moment a passing train or a tunnel drowns the key words, and the subsequent plea for non-talking compartments has a certain flavour of sour grapes. As to the man who tries to engage an unwilling victim in talk, he can usually be disposed of if given something else to think about. One of this sort recently invited the writer to join him in lamenting that they were obliged to spend a fine day in a railway carriage. The reply that the writer could imagine no day so fine but that it would reveal new glories when viewed through the spotless windows of a rapidly moving train, evidently suggested a line of thought so novel to him that he pondered it in silence for the rest of the journey.

Summer Train Services

DETAILS have now been announced by the Great Western, London Midland & Scottish and London & North Eastern Railways of the summer timetables which will come into operation on May 6, and which carry further the progress towards pre-war standards begun with the services of October 1 last year. All three companies are making further additions to their restaurant and buffet-car services, a procedure which has been carried on steadily since October 1 on the L.M.S.R., L.N.E.R., and Southern Railway, and since December 31 on the G.W.R. Many additional trains will be run, which will permit improvements in some long-distance journey times by the deletion of intermediate stops. On the G.W.R. overall timing improvements will be achieved also by the restoration of certain slip coaches. The introduction of a full summer service in May will benefit those taking their holidays early, whose numbers will no doubt be increased in compliance with the Government's advocacy of a spreadover in holidays to relieve pressure on transport and at the resorts. In pre-war years it was customary for certain seasonal trains to be put on in May, followed by a full summer service operating between July and September. So far there is no restoration of high-speed streamline services.

The G.W.R. programme provides for 553 additional main-line and local trains on weekdays and 278 on Sundays, apart from 117 new Saturdays only services. The "Cornish Riviera Limited" reappears as a named express for the first time for six years, and will run non-stop between Paddington and Plymouth in both directions on weekdays (calling at Exeter on Sundays). To Plymouth, the journey is cut by 15 min., and to Penzance by 25 min., compared with the present 10.30 a.m. service, but the times of 4½ hr. to Plymouth and 6 hr. 55 min. to Penzance are both 30 min. longer than the schedules in the summer timetables of 1939. The "Torbay Express" will also be restored, running non-stop between London and Exeter on Mondays to Fridays and non-stop throughout on Saturdays. New business expresses will run between Paddington, Plymouth and Swansea, and there will be additional expresses between Paddington, Malvern, and Hereford. The restored slip carriages will serve Bath, Reading, Bristol, and Didcot.

Restaurant-car services will total 45, as compared with 26 reached with the restorations of February 4, and there will be four buffet-car trains. The Birkenhead-Bournemouth through service will be resumed on weekdays. Sunday services will be restored on several branch lines, and the Vale of Rheidol branch will be re-opened with a weekday and Sunday service on June 9.

On the L.M.S.R. 12 more trains will have restaurant cars on weekdays and three on Sundays, bringing the weekday total to 56 and the Sunday total to nine. In addition to the Euston-Liverpool, Euston-Stranraer, and St. Pancras-Edinburgh trains to which the cars will be restored, certain Carlisle-Glasgow and Dundee-Glasgow trains are included, and a restaurant car service will be provided in the "Far North" between Inverness and The Mound. Additional long-distance trains will number over 30 on weekdays and 17 on Sundays. The Midland Division will benefit in particular from the elimination of intermediate stops on long-distance trains, the night train from Edinburgh to St. Pancras saving 80 min. in this way. On the London-Manchester route there will be a 45-min. cut in one up schedule and a 32-min. cut going down. Anglo-Scottish services will be augmented by two new night trains from Euston, bringing the total to seven (six with sleeping cars), and a new day service from Perth to Euston at 12.15 p.m. On Sundays there will be a new train from Glasgow Central to Euston at 11.30 a.m. More trains will also be provided between Birmingham, Liverpool and Manchester, and Edinburgh and Glasgow. Increased cross-country services will be run between Manchester and Bournemouth, and Bradford and Torquay.

The 80-min. acceleration between Edinburgh and St. Pancras referred to above will be made by the 9.50 p.m. (present 10.5 p.m.) which will cease to call at Leeds and Chesterfield, reaching London at 8.5 a.m. The new overall time of 10 hr. 15 min. compares with 10 hr. 5 min. by the pre-war 9.55 p.m. On the Manchester-St. Pancras route, the 2 p.m. up will omit its present stops at Loughborough, Market Harborough, Kettering, Wellingborough, Bedford, and Luton, saving 45

min. as mentioned above, and giving a Manchester-London time of 4 hr. 45 min. The pre-war 2 p.m. was allowed 3 hr. 50 min. with the same stops as the present train on its new schedule.

The L.N.E.R. is putting on 14 more restaurant car and 22 more buffet-car services, increasing the total in operation to 75. New trains from Kings Cross to Newcastle will run on Mondays, Fridays and Saturdays at 3.10 p.m. and on Sundays at 12 noon. There will be new trains to Leeds at 8.55 a.m., 10.15 a.m., and 1.10 p.m., with similar return facilities. Bradford will have new through services to Kings Cross at 7.10 a.m., 4.48 p.m., and 8.57 p.m. On the G.C. section the present gap between 9.50 a.m. and 3.30 p.m. in the Marylebone to Manchester service will be filled by a restaurant-car train at 12 noon, corresponding to the pre-war 12.15 p.m., with a return service from Manchester at 8.20 a.m.

The service between Liverpool Street and the East Coast resorts will be considerably increased on Saturdays, and there will be a new daily express at 7.15 p.m. for Norwich via Cambridge. On cross-country routes, the present Leeds-Colchester trains will be replaced by a Peterborough-Harwich service. The present Newcastle-Southampton trains will be extended to Bournemouth, and there will be an additional through service between Sheffield and Bournemouth. A number of through trains, mainly on Saturdays, will be provided between the Midlands and North and resorts in East Anglia, Lincolnshire, and Yorkshire. Other improvements will be made in the services between York, Leeds, Hull, and Scarborough, and between the Newcastle area and Blackpool. Local services in London and the Provinces will be increased.

A Tribute to the Railway Engineer in India

THE profound ignorance on the subject of the Empire, from the top to the bottom of the educational scale, has done much to promote the crying down of our Empire, now fashionable in certain circles." This pronouncement by Lord Elton is quoted in "The Unsung: A Record of British Services in India," by Maud Diver, which is a successful attempt to correct that educational defect in so far as knowledge of the work and achievements of civil and military engineers in India are concerned. Its foreword opens with the words: "At a time when England's work for India looks like nearing an end—though it may be nearing its finest phase—one feels justified in attempting even a partial record of essential work for the country and for the people, carried out during the most creative period of British rule. Little of that work is realised outside India, where it is mainly taken for granted; and a large measure of it has been done by men in the less-regarded Imperial services . . ." "Britain's greatest work—there as elsewhere—was carried out by individual men of genius and character, most of them disinterested men—a point too often overlooked." "In essence theirs was no political achievement, though often adversely affected by the pendulum-swing of party politics in England and more recently by the 'political-minded' few of modern India who claim to speak for many millions, and are frequently disposed to misrepresent and deny the value even of Britain's outstanding services to their country." "Financial gain, accruing to Government from railways and great public works, has been spent almost entirely in and for India. It has never been the main motive behind any great undertaking. The aim has always been to develop the country and increase the well-being of its people. Furthermore, in no case does any question of profit arise for the men who do the actual work." So pertinent are all these passages in the foreword that we have ventured to quote them verbatim, even though they are not necessarily of specific railway interest.

The author, after referring briefly to Rowland Macdonald Stephenson as the Father of Indian Railways, and to their inception generally—"railways that were to exercise an influence more far-reaching than in any other country in the world"—contents herself with references to the respective engineers, and with describing the Sind-Peshin and Khyber constructions as examples of railway engineering achievement in India. Both, though boldly conceived and embodying very fine and most spectacular engineering works, are in many

respects little, if any, greater feats of survey or of construction work in aggregate than those of some other railways in India and Burma. A few we have in mind are the Bolan route to Quetta, the Assam-Bengal hill section, the Great Indian Peninsula Western Ghats, the Kalka-Simla line, the Nilgiri Railway in Southern India, and the Lashio and Southern Shan States branches in Burma, the two latter involving some of the most difficult survey problems and greatest lengths of heavy construction works of them all.

Then, too, there are the many great bridges for which Indian railways are justly renowned, such as the Lansdowne cantilever and other bridges over the Indus, Jhelum, and Chenab rivers, the Hardinge and other bridges over the Ganges, the long Sone and Godavari bridges, and the Irrawaddy bridge in Burma, to mention but a few. Each of these great railway and bridge construction works was supervised by an engineer of outstanding ability, and, under him on the work, the Executive and Assistant Engineers carried heavy responsibilities and had to be men of initiative, tact, and endurance, being almost invariably out "in the blue" all the year round, facing climatic, racial, technical, and other foreseen and unforeseen difficulties in another "silent service." Not that railway engineers the world over are normally other than "unsung"; individually, they would not have it otherwise. Pride in achievement and the satisfaction in overcoming nature's and other obstacles are sufficient incentive to them. At the moment "The Unsung" happens to focus public attention on those in India, but many of the eulogies in that book might equally well be applied to their fellow engineers in other lands, as they themselves would be the first to point out.

Tanganyika Railways & Port Services

THE report of the Tanganyika Railways & Port Services for the year ended December 31, 1944, is again issued in a reduced size to conserve paper supplies, but all essential statistics and accounts are included. Gross receipts from railway, road, river, and lake services were £1,164,909, compared with £1,097,234 in the previous year. Expenditure totalled £882,131, leaving a net revenue of £282,778 as against £321,786 in 1943. Gross earnings from port services were £212,791, and the final surplus under that heading was £19,915, as compared with a deficit of £1,170 in the previous year. The report draws attention to the considerable increase in passenger travel during the war years, and gives comparative figures of passenger journeys back to 1940. In that year the total number of passenger journeys in all classes was 511,869, whereas the corresponding figure in 1944 was 1,369,167. All this extra traffic had to be handled without additional rolling stock and in spite of a severe shortage of trained staff. In the Tanga coastal zone it became necessary to run passenger trains in place of railcars to provide the capacity required, and by the end of the year the use of railcars had ceased altogether. The 25 per cent. reduction in third class passenger fares on railcars and passenger trains run in substitution thereof was cancelled as from April 1, 1943, but coastal section traffic continued to increase and totalled 510,881 journeys in 1944. Railway operating statistics and financial results for 1944 and 1943 are compared in the following table. It should be noted that the last three items cover the combined results of railway, steamship, and road services:—

	1943	1944
Passengers	1,172,808	1,369,167
Revenue goods, tons	333,428	351,221
Revenue goods, ton-miles	81,154,356	72,021,374
Train-miles	1,142,474	1,160,062
Average haul, miles	243	205
Operating ratio, including renewals	69.6	73.6
Coaching revenue	£ 342,941	£ 370,860
Goods traffic revenue	613,785	622,290
Gross receipts	958,259	1,025,131
Working expenditure, including renewals	685,422	754,333
Balance of revenue account	327,501	286,844
Interest and redemption charges	279,310	278,677
Surplus	48,291	8,167

Locomotive running expenses mileage run were both higher in 1944, but the cost per mile increased considerably. This arose mainly from the greater use of coal and its higher cost per ton. Maintenance costs in wages and stores have

also risen, and the increasing age of locomotives and vehicles has necessitated heavier repairs, particularly to boilers. Passenger vehicle mileage on the Central line rose from 6,457,150 to 6,670,577, and on the Tanga line from 8,015,500 to 8,205,921. It was frequently necessary to transport third class passengers in covered goods wagons owing to the heavy demand made upon passenger stock resources by the increased traffic.

Record Freight Traffic in 1944

ON March 20 Mr. G. R. Strauss, Parliamentary Secretary to the Minister of War Transport, told the Mansion House Association on Transport that the Government road haulage organisation had handled 55,000,000 tons of goods last year, representing 1,350,000 tons more than in 1944. *The Times* headed its report of the speech "Road Haulage Increase," but we cannot say whether there really was more haulage performed until the average length of haul for the two years is given. The ton-mile is the only dependable unit for measuring the volume of transport work. Such railway statistics as have been doled out for the war years show the force of this contention. The freight tonnage originating in 1943 was the highest ever—about 337,000,000 short tons. Forwardings in 1944 declined by nearly 9,000,000 short tons, but a record ton-mileage of about 27,376,000,000 was achieved in that year, because the average length of haul was stretched by 3 miles or thereabouts to 85 miles. In this calculation and in all the railway figures that follow a ton has been reckoned as 2,000 lb. That will make it easy to compare our results with the American statistics quoted below which are based on short tons.

For the U.S.A. railways 1944 was a "banner" year in every respect. They despatched more than 4 tons for every ton forwarded over our railways. Their originating traffic of 1,491,492,000 tons represented an increase of 48 per cent. over 1940 and the average haul lengthened by a third during the war to 475 miles. In consequence American ton-mileage reached the enormous total of 737,246,000,000, or, say, 27 times the volume of our railway freight movement. The quantities handled in the States were astonishing. Over 501,000,000 tons of coal were carried—more than two and a half times the total output of our collieries. Iron ore passed to the amount of 100,500,000 tons in wagon loads averaging over 61 tons. With wheat wanted so badly in a famished world, it is interesting to see that close on 777,700 wagons were loaded in 1944 with 50 tons each on an average. The total loadings of wheat amounted to 38,909,000 tons, nearly double the quantity forwarded in 1940. The Western District sent out 83 per cent. of the wheat as well as the great proportion of 10,000,000 tons of oats, barley, and rye. The States are a happy collecting ground for large wagons. In comparison our railway business is a retail affair, offering a limited field for wagons of over 12 tons capacity.

Deservedly the Americans are proud of the ability of their privately-owned railways to meet the unprecedented demands for transport in 1943 and 1944. They contrast the fluid state of traffic working in those years with the delays and congestion prevalent in the first world war after the lines were taken over by the Government and managed by the United States Railroad Administration. On the return of the railways to their owners, operating quickly improved, and traffic expanded until in 1929 ton-mileage reached a peak overtopping the best of the first war years by 14 per cent. and every subsequent year to 1941 by a wider margin. When America entered the war, ton-mileage soared upwards and in 1944 attained a peak nearly two-thirds above the 1929 record. The feat of dealing with this gigantic volume of transport was performed with a stock of 1,770,000 wagons having an average capacity of 51 tons. In 1929 there were 2,278,000 wagons in service, but on an average these could carry only 46 tons. The 1944 wagon load was 33 tons, an advance of 6 tons on 1929, and the bigger load travelled 52 miles a day as compared with 34 miles. So more transport was performed in 1944 by loading 43,441,000 wagons than was done by despatching 52,828,000 loads in 1929. The wheels were kept turning so fast that 17,621 net ton miles were worked in a freight-train hour, a 66 per cent. advance on

1929. This result dwarfs the corresponding figure for the British railways of 1,261 net ton miles, about 10 per cent. more than the number worked in a freight-train hour before the war. The average American "freighter" of 53 wagons, containing 1,138 tons, travelled at a speed of 15.7 miles an hour—at least twice as fast as our average train of 35 wagons carrying about 200 tons.

American statisticians have the knack of tabulating compactly "performance averages" such as are quoted above. One sheet of paper will embrace 30 sets of figures for as many years. With equal clarity a summary of wartime changes in freight traffic trends was prepared in October, 1945, by comparing tonnage originating in 1940 and 1944. The table below indicates how the traffic was analysed into 6 main classes, covering 135 commodities.

U.S.A. REVENUE TONNAGE ORIGINATING IN 1944

Class	Number of commodities	Originating tons (millions)	Increase on 1940 Tons (millions)	Increase per cent. on 1940
1 Products of agriculture ...	39	146	57	64
2 Animals and products ...	12	25	10	64
3 Products of mines ...	17	785	215	38
4 Products of forests ...	11	84	26	44
5 Manufacturers and miscellaneous ...	56	431	169	65
6 Less-than-wagon-load freight ...	—	20	5	37
Total ...	135	1,491	482	48

Separate figures are given for each commodity together with the proportion of the tonnage arising in the Eastern, Southern, and Western Districts. One can see at a glance that the tonnage of sugar beet declined from 6,400,000 tons in 1940 to 4,500,000 in 1944 and that the whole of the 30 per cent. decrease was in the West. The forwardings of fresh grapes from the Western regions also decreased by 150,000 tons or 30 per cent. What would we not have given for a share of the 3,928,000 tons of oranges and grapefruit carried—an excess of 86 per cent. over the 1940 forwardings! The bulk of the increased tonnage came from the South, but the West despatched a fine crop of apples—74 per cent. of 960,000 tons, a fifth more than the weight passing in peacetime. Large increases also took place in other traffics which have to be loaded in refrigerator wagons—one item was 25,000 wagons of peaches and another 31,000 wagons of watermelons. So it is not surprising that one of the main war problems of the Car Service Division was how to maintain an adequate supply of "reefers."

Probably enough has been said to show that the tonnage analysis makes a fascinating study. A second statement deals with the revenue earned from the various commodities. Though American freight rates were not advanced during the war, freight revenue increased in a higher proportion than tonnage as will be seen from the next table.

U.S.A. FREIGHT REVENUE IN 1944

Class	Revenue \$ (millions)	Increase per cent. over 1940
1 Products of agriculture ...	913	79
2 Animals and products ...	293	70
3 Products of mines ...	1,638	52
4 Products of forests ...	354	50
5 Manufacturers and miscellaneous ...	3,759	162
6 All less-than-wagon-load ...	374	51
Total ...	7,331	99

The almost doubling of revenue between 1940 and 1944 reflects the development of high class merchandise and the lengthening of transits as well as the increased quantities put on rail. The average revenue per ton was 4.8 dollars and per ton mile less than one cent.

Our American friends are fortunate in the possession of systematic and up-to-date knowledge of traffic trends in their vast country. The lack of such information in our small island is regrettable. We have reached a somewhat ridiculous stage when the Ministry of Transport fails to circulate adequate railway returns periodically, while the Board of Trade has accepted the report of a special committee that a distribution census is both practicable and necessary in the public interest. We agree that a comprehensive survey of distribution activities, including transport, is desirable and should be arranged, if possible, for the year 1949. The Government has just published a summary table of statistical returns of the railways of Great Britain for the years 1939 to 1944, inclusive, and should let us have regular returns in future containing full operating results.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Bourne End Accident, L.M.S.R.

51, Goldsmith Avenue,
Acton, W.3. March 28

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Many qualified signalmen will be in disagreement with the report of Lt.-Colonel Mount on the cause of the lamentable fatal crash at Bourne End on the L.M.S.R. last September. It must be as clear as daylight that the crash would have been entirely averted had the signalman adopted the course taken in similar circumstances on other main lines.

Had the signalman at Bourne End kept his distant signal at danger, this should have ensured the unfortunate driver reducing speed and being prepared to stop at Bourne End home signal, and it is patent that the signalman should not have altered the points for the fatal crossover until he was positive speed had been reduced to safety speed for this purpose. Then he could have altered the points and pulled off the crossover signal.

Had the driver failed to stop or reduce speed as expected, he would have run on a considerable distance without mishap, even against signals, until he realised his position. The purpose of the crossover on this occasion was the occupation for repairs of Watford tunnel, and even if the express had got that far the consequences would have been less. The coroner made strong remarks at the inquest as to what he would have done with the driver, if he had escaped death; but did the driver know until he reached the crossover that he was in such a serious position at the speed at which he was travelling? Strange that a precisely similar accident occurred also on a Sunday at Leighton Buzzard, only a few miles away on the same railway going in the opposite direction, and the lesson of that fatal crash has been of no avail; otherwise the Bourne End crash would never have occurred.

Yours faithfully,

J. V. A. KELLY

[Our correspondent appears to have overlooked the fact that at Leighton Buzzard all the relative signals were at danger. We cannot see how, if a driver passes a double yellow warning indicating that he is to reduce his speed—an indication the meaning of which, at the particular location and as a competent man, he must be aware of—and he does nothing but continue to drive at high speed, it can be contended that he would necessarily have acted on a single yellow warning.—ED., R.G.]

Lessons from Accidents

119, Norbiton Hall,
Kingston-on-Thames.

April 4

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Since writing my letter of March 11, I have read and re-read Lt.-Colonel Sir Alan Mount's very thorough and instructive report on the fatal accident at Bourne End last September. Notwithstanding very careful consideration of the whole report I can see no reason for modifying any of the comments in my letter or making any changes in the suggestions therein, both of which I had thought might be necessary. Certain facts stand out rather prominently and I hope that I may be excused for calling attention to them now.

From the time that Swaby signed on for duty at 1.13 a.m. until his train left at 5.45 a.m. no one apparently considered it necessary to warn or remind him of the diversion and speed restriction at Bourne End; no one mentioned these facts in conversation with him; nor were these facts referred to when he took over the train and there was some talk with the guard.

When the train passed Berkhamsted he (Swaby) was seen to be seated as though he were "all set" for a longish run at the then high speed which was estimated to be about 60 m.p.h. Obviously he was quite oblivious of the fact that he was only about one and three-quarter minutes from the point where a diversion was to take place and a reduction of speed to 20 m.p.h. had been ordered, and only about 20 seconds from the point where he would sight the distant signal which was intended to give warning thereof.

A lot of space is taken up in the report on the subject of alternative warning signals without any definite or convincing results. If a reduction of speed is necessary in the interests of safety what possible objection can there be to keeping a stop signal at red until the necessary reduction of speed has been made? When the signalman is satisfied that speed

has been reduced as ordered he could free the signal and all would be well. If it were desired to relieve the signalman of this duty and leave him free to attend to other necessary duties (an important point in a busy box) the same result could be attained, probably with more exactitude, by means of two track circuits. One of these, with a delay action device incorporated, could check the reduction of speed and if this were as ordered would allow the second one to free the signal. If the reduction of speed were insufficient the second circuit should be prevented from freeing the signal without some further action on the part of the signalman which should be recorded in the train register.

Yours faithfully,

W. G. TYRRELL

Railway Threats to Antiquities

Langdale Chase Hotel,
Windermere, March 16

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—A paragraph in *The Times* of March 16, 1846, under the heading "British Archeological Association" mentions that the intervention of Mr. I. K. Brunel secured the diversion of the Weymouth Railway from the site of the Roman amphitheatre at Dorchester, which it had been planned to cut through.

Reprinting this paragraph on March 15, 1946, *The Times* added the gloss: "New railways were destroying or threatening medieval, Roman, and prehistoric antiquities." It would be interesting if you, Sir, or your correspondents, could say how far this general statement is justified. One can call to mind the final demolition of Northampton Castle when the present station was built, some thirty years after the date of this extract; possibly Berkhamsted Castle grounds suffered slight contraction when the Birmingham line was built; certainly there must have been other cases. But is it true, as a general statement, that our antiquities suffered much loss due directly to railway building?

Yours faithfully,

R. M. ROBBINS

Hemel Hempstead—Harpenden Branch

Hurst Wickham, Sussex, March 28

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I regret other matters until now have precluded me from replying to Mr. Bygrave's letter on above subject in your issue of February 22 last. I can see no point at issue in my letter in *The Railway Gazette* of December 14 last. I distinctly qualified my suggestion in my letter on p. 610 of your previous volume, by using *probably* in italics, which should have been sufficient to close a discussion.

However, Mr. Bygrave, fortified by references for which he is indebted to Canon R. B. Fellows, thinks otherwise. I will not trouble to refer to the Acts Canon Fellows is at pains to quote, but mention that the Luton, Dunstable & Welwyn Junction Railway, by Act of June 12, 1861, was amalgamated with the G.N.R.

The G.N.R. therefore became possessed with the railways, etc., of the amalgamated companies crossing it on the level, or doing so after the amalgamation. The G.N.R. therefore could work trains to and from any point on the L.D. & W.J.R. across its line on the level, without making the previously-forbidden junctions, so long as such junctions did not pass over land not possessed by the G.N.R.

As the G.N.R. ran the trains from the east and west extremities of the L.D. & W.J.R., the connection with the G.E.R. at Ware, by running powers, enabled the G.N.R. and G.E.R. to adopt the route desired in particular.

Since the G.N.R. and G.E.R. now form part of the L.N.E.R., the liberty as to routes is even enlarged.

Yours faithfully,

G. A. SEKON

WARNING BELL FOR TICKET MACHINE FAILURES.—London Transport is to test the usefulness of a bell for passengers to ring when automatic ticket machines fail. When a machine fails to operate at busy periods, it may now be some time before the attention of a member of the railway staff can be attracted, with consequent irritation to the passenger and to others wishing to use the machine. The board has therefore decided to install, during the next few weeks, bell pushes over two banks of ticket machines at Victoria Station, and over three banks of machines at Tottenham Court Road. A sign reading "Should machine fail please ring bell," will be placed along the top of each bank of machines. The bell push will operate an audible and visual indicator in the ticket office.

The Scrap Heap

L.M.S.R. SALVAGE STILL GOING STRONG

Two thousand tons of metal were salvaged by L.M.S.R. staff during last year. They also collected 1,614 tons of paper, 463 tons of timber, and 327 tons of rope and string, and 378,767 bottles were sent to the L.M.S.R. reclamation depot at Manchester for disposal to bottling firms.

NAMING OF LOCOMOTIVES

The 35 years' life of the Institution of Locomotive Engineers has been contemporaneous with a new interest in the locomotive by the railway companies themselves. There has been a revival in the practice of naming locomotives.

One hundred years ago every locomotive had a name, and very good classical names they were too, such as *Colossus*, *Canopus*, *Polyphemus*, *Bacchante*, and *Jupiter*.

Gradually the practice decreased and only the London & North Western and Great Western Railways maintained it right up to grouping. The old London, Brighton & South Coast gave it up because most of its engines were named after places to which the trains were not going. One locomotive was distinguished by name of *Crawley*.

Lately, we have had a revival of the practice of naming locomotives, and more than that, they now have naming ceremonies and invitation luncheons afterwards. The Southern has about one a week with the "Merchant Navy" and "West Country" classes, and the L.M.S.R. with its engines named after regiments and cities.

But a change is coming in this naming business. It won't be left to the C.M.E.'s or even the General Managers to choose their locomotives' names much longer. The Railway Commercial Departments, the Advertising Managers, and Public Relations Officers see a new source of revenue and are going to let the names out at so much a year.

Then we may expect Mr. Ivatt's next set of L.M.S.R. Pacifics for the Anglo-Scottish services to be known as the "Whisky" class. We may soon see the locomotives drawing London and Glasgow trains bearing such famous Scottish and Irish names as *Johnny Walker*, *James Buchanan*, *White Horse*, *John Haig*, *Black and White*, *James Dewar*, *John Jamieson*, *John Power* and *Old Angus*.

Whether the North Eastern or Great Western will be first to introduce the "Patent Medicine" class with christening ceremonies performed by Lord Horder, and other eminent doctors from Harley Street, remains to be seen. These fine engines will have some handsome sounding names, such as *Phyllosan*, *Aspro*, *Phosphorine*, *Yeastvite*, *Bisodol*, *Citralka*, and *Penicillin*.

How the nationalisation of railways will affect the locomotive naming business is rather a problem. One thing at least is certain. There won't be any more locomotives named after railway directors.

No doubt we shall have more attention paid to the proletariat. In fact already it is reported that the back room boys of the Ministry of Transport are now busy designing a new type of austerity locomotive to be known as the "Common People" class. They will be named to commemorate those great English families which are now being eulogised by the B.B.C., the Browns, Smiths, Joneses, Robinsons, and so on. Thus, we may soon expect to see running on our nationalised railways, locomotives bearing such famous names as *Harry Smith*, *William Brown*, *Paul Jones*, *Sam Isaacs*, *George Robinson* and *John Thomas*.

100 YEARS AGO

From THE RAILWAY TIMES, April 11, 1846

THE PREMIER'S RAILWAY COMPANIES

RELIEF BILL.—At a meeting of scripholders representing a considerable amount of stock in the numerous Railway and other Companies, it was determined to adopt combined measures to put a stop to the frightful expenses being incurred, and to have a large proportion of the schemes wound up.

The advantage of this must be obvious. Those, therefore, who approve of such a course, are requested immediately to communicate with Mr. Rowatt, Solicitor, 41A, Lamb's Conduit street, London, where petitions lie for signature in conformity with the proposed Relief Bill.

N.B. Parties residing at a distance, may concur in the above measures by forwarding a proper authority to Mr. Rowatt.

The following are some of the railways, &c., to which the above notice applies:—Cork and Waterford, Ayrshire, Bridge of Weir, and Port-Glasgow Junction; Alverstoke, Furness, Lancaster, and Carlisle; Midland Great Western Railway of Ireland, Argyll Canal, Caledonian Northern Direct, Caledonian Extension, Cornwall and Devon Central, Dunblane, Doune, and Callander; Wexford, Carlow, and Dublin; Edinburgh and Leith Atmospheric, York and Lancaster, Yorkshire and Glasgow Union, Cornwall and West Linton, North Devon, Wexford, Waterford, and Valentia; London and South Essex, Reading, Guildford, and Reigate; Chelmsford and Bury, Liverpool, Manchester, and Newcastle-on-Tyne; Northumberland and Lancashire Junction, Trent Valley Con-Union and Holyhead Junction, Mauritian Railway Company, Aberdeen, Banff, and Elgin; Bradford, Wakefield, and Midlands; Worcester, Hereford, Ross, and Gloucester; Launceston and South Devon, London and South Wales Direct, British and Irish Union, Glasgow, Dumfries, and Carlisle; Southampton and Manchester, Lanarkshire and Lothians.



Mafeeking porter

IN THE BUFFET CAR

I am a regular traveller on a certain Saturday morning train to the South Coast. Last Saturday there was a race meeting at the South Coast end of the journey and the train was rather more crowded than usual.

When my wife and I went into the recently restored buffet car for breakfast, only one seat (at a table for four) was vacant. My wife took that. I stood. This was just after the train had passed East Croydon (10½ miles from Town). One lady at the table had obviously finished a light repast of coffee and toast. She was settling down to do a cross-word puzzle. At Horsham (40 miles from Town) she lit a cigarette. At Pulborough (50 miles) she was still there.

Between Croydon and Redhill, a man at the next table rose. As I was about to take his seat, another lady at my wife's table asked if I would like to change with her so that I could be next my wife. I expressed appreciation. As I took the offered seat, I asked if I could pass to her new place her half finished cup of tea. "Oh," she exclaimed. "I don't want that."—From the "Yorkshire Post."

NEXT WEEK'S RAILWAY CENTENARY
Miles Plating to Ashton (5 miles), Manchester & Leeds Railway, opened on April 15, 1846.

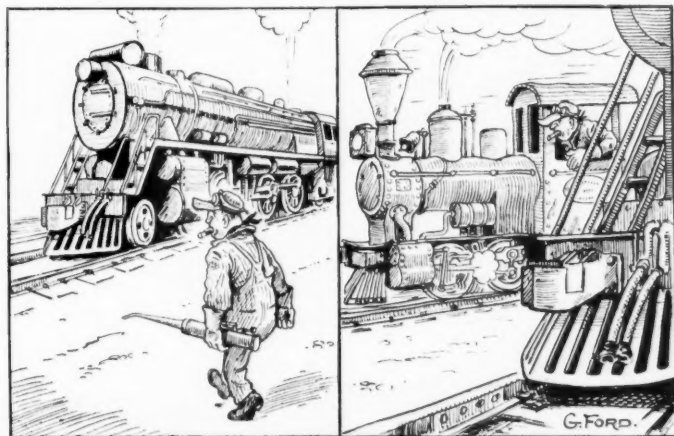
TAILPIECE

Railway Publicity—New Style?
Presuming that the railway fate is operation by the State.
Are we no more to see and hear
The gay appeals of yesteryear?

Posters of mountains, hills, and dells,
Of promenades and bathing belles,
Books that proclaimed how fierce the sun
Blazed down on Ryde or Bridlington
—Will these allure to private choice
Yield to some dictatorial voice?

A voice that says "go here, go there!
(Which route you choose we do not care);
For guidance in your summer sport
Peruse this Government report
Entitled "Where to Take Your Ease"
And stamped "For your attention, please."

B. K. C.



Watch them drivers roll

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

WESTERN AUSTRALIA

£4,000,000 for Rehabilitation

The Premier of Western Australia, the Hon. F. J. S. Wise, has announced that the State Government has approved of an extensive rehabilitation programme for the railways covering ten years, and involving expenditure of nearly £4,000,000. The programme will be put in hand immediately. Mr. Wise said the programme included additional rolling stock, alterations and additions to the workshops at Midland Junction, and a programme of deferred maintenance of permanent way. The estimated cost of the whole programme is £3,776,500, made up as follows:—

New rolling stock	£ 2,625,000
Alterations to workshops and purchase of new machinery	197,000
Six new diesel trains	234,500
Deferred maintenance of tracks	600,000
New road buses	120,000
	3,776,500

New Dining Cars

The new rolling stock programme will include provision of new sleeping cars and new dining and kitchen cars. For some time consideration had been given to elimination of dining cars and provision of meals at centres where adequate facilities could be made available. With the uncertainty as to the altered timetable which will result when the normal running of the Westland interstate service is resumed, it was felt that a better arrangement would be to improve the existing service by new dining and kitchen cars.

Diesel Trains for Country Services

In regard to country passenger services, it has been recognised that passengers have been inconvenienced, first by a slow mixed goods and passenger train service, and also by the fact that in many cases the trains have to follow lines which unduly lengthen the trip. Under the programme which has been approved, the slow mixed train will be eliminated by provision of express diesel trains for passenger services only, leaving the ordinary train to take the goods traffic. The problem of the roundabout journey by rail compared with the more direct road route will, it is felt, be overcome by the development of departmental road services as feeders to or in conjunction with the rail services.

The suburban passenger service has been improved by the provision of a modern suburban train (see *The Railway Gazette* of March 1), and the favourable comment among suburban travellers has encouraged the belief that this improvement should be extended.

Replacing Locomotives

The outstanding difficulty in the way of improving railway transport has been the shortage of locomotives. Many of the existing locomotives are over 50 years old and require constant attention, with the result that the department has at no time had its complement of locomotives available. Inquiries were made some time ago to ascertain the possibility of securing locomotives built in Australia, and at the same time of obtaining them from overseas. In both cases the replies received were discouraging. The Australian workshops will be fully engaged in meeting demands which will have to be met before our programme could be satisfied. In Great Britain and elsewhere the prospect

is no more bright. The programme of £3,776,500 therefore provides for the building of locomotives at the workshops at Midland Junction. It is expected that with the additions to the workshops and the provision of new machinery, 15 locomotives will be built annually at Midland Junction.

Negotiations are proceeding for the purchase from Great Britain of 14 4-6-2 locomotives built by the North British Locomotive Co. Ltd. in 1943 for use in the Sudan, but which were not required there because of the changing war situation. They should make a welcome addition to the department's depleted locomotive stock, being of high tractive effort. The locomotives were described in *The Railway Gazette* of September 17, 1943.

NEW ZEALAND

Christchurch to Picton Trunk Line

The opening of the line between Kaikoura and Oaro, in the South Island, on December 15, 1945, filled the last gap in the east coast railway route from Christchurch to Picton. The project dates back some 70 years, the section southwards from Picton to Blenheim having been opened on November 18, 1875. It was not until March 13, 1944, that there was continuous rail connection from Picton to Kaikoura. In the south, the railway from Addington, near Christchurch, to Rangiora was opened throughout on November 5, 1872. By September 2, 1912, the railway had reached Parnassus, eight miles north of Mina. The next opening on the southern section did not take place until November 27, 1939, when the line reached Hundalee. In the north a southwards extension of 19 miles from Wharanui to Clarence was opened on October 19, 1942. A road motor service was operated between Clarence and Hundalee until May 17, 1943, when trains on the southern section began running to Oaro. The northern section of the line reached Kaikoura on March 13, 1944.

The opening of the final link between Kaikoura and Oaro, on December 15 last was marked by an official ceremony at Kaikoura, to which excursion trains were run both from Christchurch and Picton. Ordinary scheduled services began on December 17, with one through Christchurch-Picton train in each direction daily. From January 7, however, coal economies have necessitated limiting the through services to three days a week. The journey takes 8 hr. 10 min. northbound and 8 hr. 17 min. southbound for the 217½ miles. Between Waipara and Kaikoura allowance is made for the trains to call at all stations if required, this 79-mile section being allotted nearly 3 hr. in the timetable. Faster running is made between Christchurch and Waipara (41

miles) where stops are comparatively few. Between Blenheim and Kaikoura, the southbound train is allowed 2 hr. 43 min. for the 80.2 miles, with seven intermediate stops and a ruling grade of 1 in 50.

SOUTH AFRICA

Railway Budget, 1946-47

The South African Railways are expected to have ended the financial year to March 31 with a deficit of just over £1,250,000, announced the Minister of Transport, Mr. F. C. Sturrock, when he presented the Railway Budget in the House of Assembly on March 1.

The Minister said the present year had been one of the most significant in the history of the South African Railways. The railways had changed over from a war to a peacetime footing without any effect on the tempo of operations, and had lost no time in adjusting themselves to peace conditions. All war controls had already been abolished and the plans made during the war years for the expected expansion of railway activities were being put into operation with all possible speed.

Staff Position

In December the grand total of staff employed by the railways was 151,998, of whom 89,044 were Europeans. The total increase over the previous year was 12,715. The railways had initially undertaken to absorb 2,500 ex-volunteers in addition to members of the railway staff who had been on service. The Minister stated that he was happy to say that the railways had been able to do much better. Up to date 7,632 European and 3,199 non-European ex-soldiers had been engaged and there were sufficient vacancies to enable a quota of the men still being released from the army to be absorbed into employment. The men would receive credit for their period of military service for the purpose of pensions, increments, and seniority. Work had been found for more than 1,000 disabled or partly disabled men. The majority of the men had been in railway



Railways in South Island, New Zealand, showing the Christchurch to Picton line

service before enlistment, and nearly three-quarters were doing the same type of work as they had done before the war.

Rates Policy Upheld

During the year railway rates had been a fruitful subject of controversy. The case that had been made out by critics, said the Minister, was not strong enough to tempt him to abandon a system which on the whole had worked well, and embark on new experiments with rating principles which would affect directly every citizen in the country. The increases in railway rates since 1925, including the general 10 per cent. surcharge applied in October, 1944, had been more than neutralised by rate reductions made during the same period, and since October, 1944, the average rate level had actually been $7\frac{1}{2}$ per cent. lower than in December, 1925.

South African Airways

Dealing with the South African Airways, the Minister said that they were at present being operated over a route-mileage of 10,481. From December, 1944, to the end of last January, 1,980,731 miles had been flown without a single casualty, while 40,765 passengers travelled 18,714,920 miles on regular schedules in safety and comfort. Of 6,215 flights undertaken, only 1.83 per cent. could not be completed according to schedule, mostly on account of adverse weather conditions. So great had been the demand for internal air travel accommodation that it had been decided to add three Douglas Skymasters to the South African Airways fleet, and as soon as these were in use first class mails would be carried in terms of the agreement between the Post Office and the railways. Considerable progress had been made with the construction of the international airport to serve Pretoria and Johannesburg, and with the national airports at Durban and Cape Town.

Revenue Estimate Exceeded

Reviewing the financial year 1945-46, the Minister said the estimates of revenue were framed on the assumption that conditions would continue on much the same plane as in the previous year. The traffic offering, however, had exceeded expectations, and it was now expected that revenue would reach the unprecedented figure of £64,496,000, an increase of nearly £3,500,000 over the original estimates. The strength of the administration's rates equalisation fund justified him in providing £500,000 for the betterment fund, and budgeting for a deficit of £50,000.

UNITED STATES

Diesel-Electric Power Trailers

In five important New York Central marshalling yards, the diesel-electric shunters used for pushing wagons over the humps have been equipped with power trailers converted from the chassis of old electric locomotives. In most cases a trailer is coupled to one 600 h.p. or 1,000 h.p. shunter, and has its four motors connected in series with those in the shunter. An alternative type is used coupled between two 1,000 h.p. shunters, each of which has two of the trailer motors in series with its own traction motors. In both types of trailer the motors can be switched out of circuit when the shunter is running light and hauling the trailer "dead."

A single 1,000-h.p. shunter and trailer develop a maximum tractive effort of 109,000 lb. Two 1,000-h.p. shunters and a trailer develop 171,000 lb. The trailer chassis are ballasted with scrap rails and steel or concrete blocks in order to pro-

vide the necessary adhesive weight. The cab and bodywork of the former electric locomotives have been removed, and are replaced by three housings for the control equipment (operated remotely from the shunter), sanding appliances, and a motor-driven blower for cooling.

121 Miles of C.T.C.

Centralised traffic control has been installed over the 121 miles of the Cotton Belt single-line route between Pine Bluff and Lewisville. Altogether there are 41 power-operated points, for sidings and crossing loops, and 52 electric locks on hand-operated points, all under the control of a single C.T.C. machine at Pine Bluff. Among the benefits obtained is the use of refuge sidings by heavy trains which could not enter them in the past, because if the trains were stopped for the brakeman to change the points, they could not start again on an adverse gradient. At two places there are level crossings with other railways, and here automatic interlocking has been provided between the signals on the two routes. In one instance the guard of a train requiring to cross the Cotton Belt line has to telephone Pine Bluff and request the unlocking of a hand-lever controlling a derailler. Release of the lock simultaneously sets the Cotton Belt signals at danger, in which condition they remain until the train has cleared the crossing and the derailler has been re-set.

BRAZIL

International Bridges

The "good neighbour" policy of the South American countries is taking concrete form in the construction of the large bridges which will afford through communication between Brazil, Argentina, Uruguay, and Bolivia. These bridges are being built with the financial and technical collaboration of the countries.

The bridge connecting Brazil and Argentina is being built over the River Uruguay from the Brazilian town of Uruguai, on the one side, to Passo de los Libres on the other. It is made of reinforced concrete, and the length of 1,800 m. includes 40 arches of 35-m. span and some 400 m. of approach viaduct on both banks. The bridge is $12\frac{1}{2}$ m. wide, and is designed to take a railway track, two roadways, and a passage for pedestrians, at a height of 18 m. above water level. It is situated 120 km. from Porto Alegre; 2,274 km. from Rio de Janeiro; and 728 km. from Buenos Aires.

Work on the bridge is well advanced and it is expected to be opened towards the end of this year. Both Argentina and Brazil are carrying out improvements to the Pan-American highway on either side. In addition, the Argentine Government Railway, Ferrocarril del Este, plans to extend its line some 100 km. from its present terminal station of Curaz Cuatia to Passo de los Libres, and lay a third rail in its standard gauge line from Uruguai to the port of Diamante so that metre-gauge wagons of the Brazilian railways will be able to work through to the banks of the River Paraná. At Diamante wagons can be ferried to Santa Fé, whence there are connections by Argentine metre-gauge lines to Buenos Aires, Bolivia, and to Chile via Mendoza and the Transandine Railway.

Brazil—Uruguay Bridge

The bridge between Brazil and Uruguay has been built over the River Jaguarao, linking up the town of Jaguarao, on the Brazilian side, with Rio Branco. Situated some 2,060 km. from Rio de Janeiro, and

430 km. from Montevideo, it is of concrete, 2,000 m. long. The bridge is 14 m. wide, and provides for a railway track, two roadways, and a passage for pedestrians. The centre span of 252 m. is built up of 3 arches, 30 m. wide, at a height of 6 m. above water level. On the Brazilian side it is approached by earth embankments, but on the Uruguay side, where the river overflows its banks, a series of 9 arches, 14 m. in span and 6 m. apart, have had to be built between the bridge proper and the embankment. Roadways on both sides are being improved, especially the Getulio Vargas highway, which is being laid with concrete up to Porto Alegre.

Brazil—Bolivia Bridge

The bridge between Brazil and Bolivia is being built in Brazilian territory over the river Paraguay at Porto Esperanza, and is destined to link up the Estrada de Ferro Noroeste do Brasil with the Estrada de Ferro Corumbá—Santa Cruz de la Sierra, in the interior of Bolivia. This bridge is situated some 90 km. south-west of Corumbá, and is 2,000 m. long. The single centre arch span of 110 m., in reinforced concrete, is the longest of its kind in Brazil.

MEXICO

Modernisation of National Railways

To assist in bringing the equipment of the Mexican National Railways up to the standard required for intensive wartime traffic, a United States Railway Mission was sent to the country in 1942. The mission consisted of 50 technical experts, with a staff numbering over 150 members at the height of its work. An extensive programme of permanent way and rolling stock rehabilitation was at once put in hand, aided by priorities granted to the Mexican National Railways for obtaining material in the United States. Among the items ordered have been 46 diesel locomotives and 32 steam locomotives, and 1,500 all-steel box wagons. Some second-hand rolling stock has also been purchased. Much progress has been made in modernising signalling and communications facilities, and centralised traffic control is being extended. A carrier current telephone installation has been installed on a trial basis between Mexico City and San Luis Potosi, a distance of 535 km.

FRANCE

Former Rail Terminus as Bus Station

The Gare des Invalides, in Paris, former terminus of the electric train service to Versailles (Rive Gauche), is at present being converted into a station for buses operating between the capital and its main airports in connection with air services. The station has been bought by an air transport company from the S.N.C.F., and it is stated that it will be opened shortly. The former platform area will serve as the departure and arrival hall for the buses. In addition, waiting rooms, a bar, a reading room, and other facilities are to be provided there. The ground floor will house the luggage and other offices.

To begin with, five bus services a day will operate between the Gare des Invalides and the Orly and Le Bourget airports. Passport and customs formalities will be carried out at the Gare des Invalides, and will occupy not more than 15 minutes a passenger. The Gare des Invalides was opened in April, 1900, when the line to Versailles (Rive Gauche) was placed in service. It belonged to the former French State Railways.

Railway Engineering in Britain in the First Half of the Twentieth Century*

Mr. Conrad Gribble's views on possible track and bridge building developments

IT will, I hope, be of some interest if I try to set forth some of the advantages which railway engineers enjoy today compared with those which were available half a century ago. When Robert Stephenson and Brunel were building railways and bridges they were, for example, without mild steel in any form which was useful for bridge or permanent way construction; they had no reinforced concrete nor electric welding, there were no research laboratories for them to consult, nor did any such organisation as the British Standards Institution exist. They had not available a supply of young college-trained engineers to assist them in their work.

In the latter half of the 19th century some of the most brilliant pioneers in engineering exercised their art; famous names as Stephenson, Brunel, Fairbairn, Cubitt, Hodgkinson and Baker are among them. The times were peaceful and prosperous, when not only could railways earn very good dividends, but engineering science found its feet and made great strides.

The first half of this century has been marked by a steady increase in scientific knowledge, but it has been hampered by two destructive wars. During these wars the whole of the railway engineer's energies have been directed to the maintenance of his line, repairing damage and excessive wear and tear, and carrying out such wartime works as are necessary in the national interest. Development of new methods is retarded rather than advanced except in the discovery of means to circumvent the shortage of much-needed materials.

The first and chief responsibility of the railway engineer is the track or permanent way and the bridges which carry it. Our permanent way has not been radically changed during the past fifty years, although it is stronger and better in many respects. We still use a bull head rail in cast iron chairs on timber sleepers, but we have a heavier rail, more sleepers, and much better ballast. We now use rails twice as long as formerly and thus halve the number of joints to maintain; we lay down the best stone or slag ballast on our main lines, whereas 50 years ago long stretches of our main lines were laid on ash ballast and also on shingle. What can be done now, it has been asked, to reduce the ever-increasing cost of maintaining on track?

Without making a departure in principle from the type of permanent way in use, it might be found economical to use a very much heavier and stiffer rail, either bull-head or flat-bottom, with much larger sleepers possibly of reinforced concrete, and thus provide a track of such strength that it would be much less affected by traffic and need only occasional inspection. The main difficulty inherent in such a proposal is that in the parts of the railway where the cost of maintenance is highest, that is, in the congested parts of the suburban areas, the lines are continuously track-circuited for signalling purposes and the maintenance of track circuits with reinforced-concrete sleepers is difficult and often impracticable.

It is hoped that the partial elimination

of rail joints by the use of welding will be carried forward. No serious difficulties seem to be created by the use of rails welded into lengths of 360 ft., which reduces the number of joints per mile to one-sixth of the normal number.

Bridge Building

Turning to bridges, we have to record that there are in this country bridges erected in the Nineteenth Century which are unique and stand today as monuments to the genius of their designers. The present century has not seen the erection of any bridge comparable with the Forth Bridge in this country, and until a new bridge is built over the Forth, the Severn, and the Humber the pre-eminence of Sir Benjamin Baker's bridge will not be challenged.

The use of reinforced concrete in bridges in Great Britain has been confined mainly to structures carrying roads or to culverts. High-tensile steel has not yet been largely adopted, perhaps because it is not often possible to use it economically and to save sufficient weight to pay for the extra cost. Where a really long span bridge is proposed, and saving in weight is a prime factor, the use of high-tensile steel will have to be considered. Electric-arc welding is gradually becoming a serious competitor with riveting for bridge work. This is a method of construction which has such advantages in the saving of weight and improvement in appearance that it would reward all the thought and experimental research which can be devoted to it. There is little doubt that the future will see the gradual displacement of riveting by arc welding.

The effect of the report of the Bridge Stress Committee in 1928 was in the direction of economy in bridgework compared with the current practice previously, and it had also a considerable influence on the design of locomotives. The expense of the investigation must have been recovered many times over by the savings which have been made in the design of new bridges and also in avoiding the scrapping of bridges which, but for the confidence engendered by the increased knowledge of the stresses to which they were subject, would have been renewed, perhaps unnecessarily or prematurely.

Improvements in Concrete

Although concrete is not a modern invention, its development as one of the principal materials of engineering is comparatively recent. Modern concrete is far more scientifically treated than in the early days. Fifty years ago concrete was just concrete, and even when reinforced concrete was introduced its possibilities were not at first realised. One of the principal innovations in the direction of stronger and better concrete is the practice of vibration. This can be carried out in several ways, by means of a vibrating table for small pre-fabricated articles, by vibrators attached to the shuttering, and by immersion vibrators inserted in the concrete itself.

In recent years more care and attention have been given to concrete, which it is now fully realised is a material which must be very carefully made and suited to the particular purpose for which it is intended. Pre-stressed reinforced concrete is coming into use for certain purposes, the value of

this method of construction being the avoidance of tensional cracks in the concrete under stress.

Cement has naturally been the subject of research and experiment. Contraction of concrete during hardening and curing is frequently the cause of cracking, and efforts have been directed towards manufacturing cement which has the minimum degree of contraction. Recently, however, we hear from France that a cement has been produced which gives a steady expansion during the hardening period and is particularly useful for certain types of repair work including underpinning.

The advent of reinforced concrete enabled engineers to employ longer and stronger pre-cast piles which could be extended and re-driven if necessary, and with the advantage of being resistant to attack by marine borers. Inventive minds, however, soon directed themselves to discovering means whereby concrete piles could be sunk in situations where it is impossible to erect a pile frame or to rig a long pile. Many types of what are known as bored or *in situ* piles are now available, the object of all being the construction of long reinforced concrete piles *in situ*, but in short lengths, through water-bearing or dry strata. Such piles are formed in steel tubes or concrete shells, the tubes being usually withdrawn as the pile is formed but in some cases being retained as part of the pile.

One problem which has perhaps exercised mining engineers and those responsible for tube railways more frequently than the majority of railway engineers is that of constructing works through water bearing strata where the ordinary methods of coffer dam and pumping are not practicable. Friezing, cementation and chemical coagulation have all been successfully employed where conditions are suitable.

Corrosion Problems

I wish we could claim to have won the battle against corrosion of metals, but the time is not yet when such a claim can be made. Chemists have been busy together with metallurgists in devising new kinds of steel and other chemists have been producing new types of paint. So far as the protection of steel work is concerned complete success has not been attained. As a result engineers have in many instances resorted to the use of concrete either in the form of reinforced concrete or as an encasement for steel girders. There are hopes that modern methods of spraying metal with plastics or metallic preparations after preliminary sand blasting may be a solution of this difficult problem.

I doubt whether we sufficiently appreciate the work which is done voluntarily by hundreds of engineers, technicians and industrialists in drawing up the most comprehensive series of British Standards which we take as a matter of course. Recently there has been a movement sponsored by the engineering institutions to draw up what are known as Codes of Practice for engineering operations.

I do not suppose that the natural ability of our young men today is greatly different from that of those born a century ago, but their opportunities for learning engineering are vastly improved. For many years a standard of engineering knowledge, both academic and practical, has been required of all those who desire to become qualified civil engineers, and very large numbers annually obtain the necessary certificates. The way is open to all, whatever their means, who have sufficient ability and industry, to be admitted to the ranks of chartered civil engineers.

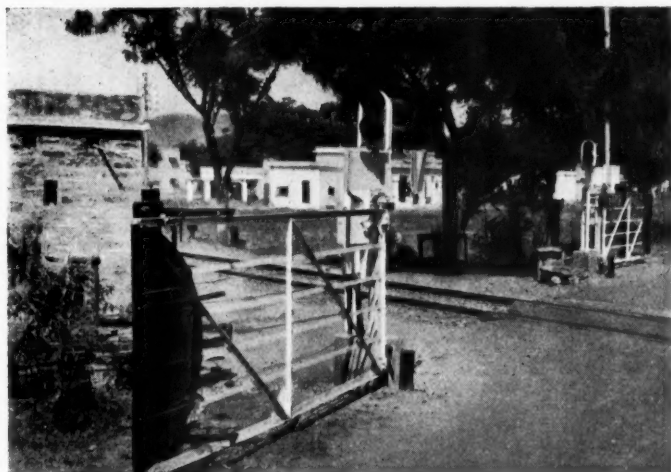
* Abstract of Presidential Address to the Société des Ingénieurs Civils de France (British Section) delivered on March 20 by Mr. Conrad Gribble, O.B.E., M.Inst.C.E., Deputy Chief Civil Engineer & Engineer for New Works & Bridges, Southern Railway

Level-Crossing Interlocking on the B.B. & C.I.R.

Successful results obtained with electrically controlled and lighted gate lamps specially aligned with respect to the roadway

By H. C. Towers,

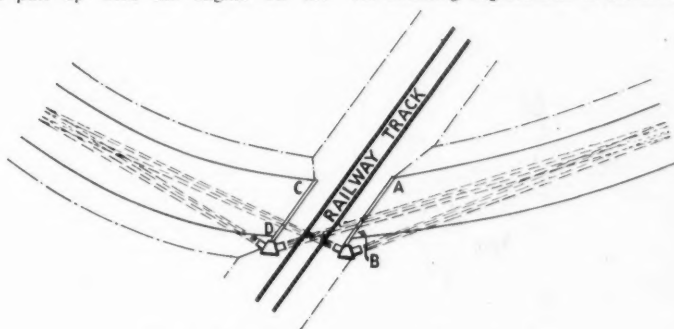
Signal Engineer, Metre Gauge System, Ajmer



IN India supervised gates at crossings are the rule rather than the exception. Signals are provided at heavily used crossings or dangerous locations when the rail approach is through a winding cutting or the view is obstructed by trees. Formerly, the practice was to erect one signal post only with an arm on each side, worked in unison by a hand lever at the base. The aspects were contradictory and the position of the signal incorrect. On one side, there was no adequate distance or overlap, while on the other the driver could pull up with his engine on the

is occupied by an approaching train a loud bell is rung at the gate lodge until the gates are closed and locked and the correct signal lowered.

A typical installation of this type exists at four level crossings between Ajmer and Madar. In the up direction, the warning is given by interlocked track circuit just outside Madar Station, operative only for up trains. In the down direction, bells are rung by an ordinary track circuit just outside the up home signals at Ajmer Station. The track circuit is inoperative for shunting engines and is cut in by the



Plan of level crossing over railway track

crossing if the arms were at danger. Orders from the Railway Board now make it obligatory to provide separately operated signals situated at not less than 600 ft. in rear of the crossing.

On busy sections, or where an approaching train cannot be seen from a reasonable distance, warning bells are provided in the gate lodges, and these may be single stroke bells operated from the block circuit, or trembling bells worked from the nearest station. In some cases a contact is made to a bell circuit through the operation of the tablet instrument to the "full slide" position. The policy of the B.B. & C.I.R. has been to displace manually-instituted warnings as far as possible and provide automatic ones actuated by interlocked track circuits. When the track

lowering of the down advanced starting signal.

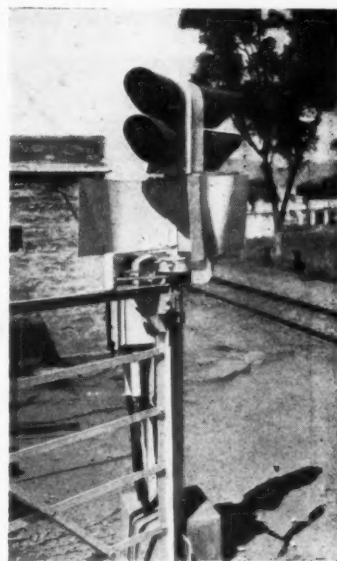
Separate up and down gate signals are provided at each crossing operated from a lever frame. Warning is given by loud bells, and the gateman is informed as to which signal to lower by the illumination of a small coloured lamp, one colour signifying "up" and another "down." The improvement to the interlocking and warning arrangements at these crossings is a recent one, and has proved most successful, since it prevents delays to heavy road traffic.

Level crossing gate lamps are generally the responsibility of the District Engineer and the Permanent Way Inspector. The use of oil for these lamps is an established practice the world over and usually

is due to the fact that electricity supply is not available. There are, however, places where electricity mains run near the level crossings. Electricity not only provides a more efficient indication, but, in cases where the road approaches at an angle to the permanent way, enables the gate lantern to be so designed that the beam is correctly directed towards approaching road traffic. A special oil lantern can be designed to achieve this object, but difficulties arise with regard to the cowlings arrangements as required by the "Rules for opening a Railway for the Public Carriage of Passengers" issued by the Railway Board.

An experiment with electrically operated gate lanterns has been successfully carried out at Ajmer and it is expected that electric lanterns will be provided at other gates. The road approaches at an angle of 60 deg. to the permanent way on one side and approximately at 45 deg. on the other side. The double-faced gate lanterns are constructed of $\frac{1}{8}$ in. sheet iron. The red and white lenses are standard signal items, 5 in. dia., secured to the lamp case with mild-steel rings and gaskets. The angle of the lenses, with respect to each other, was calculated at site with a signal sighting tube and protractor. The bulbs are 12-volt 24-watt, double filament, as used in colour-light signals.

The aspects are controlled by special contacts secured to the gate post. Each contact is fitted with a slotted arm and pin attached to the edge of the gate and works in the same manner as a signal arm commutator. The red aspect is controlled by a long, and the white aspect by a short, contact. All gate wings have to be correctly opened and secured in



Near view of gate lantern showing gate-wing circuit controller and cable box

their stops before a white aspect can be displayed. If only one wing is incorrectly opened and just touching the gate stop, but not secured, both red lights will be exhibited.

A 220 volt a.c. supply is obtained from a lighting post near the level crossing. The service box houses a 220-volt/12-volt step-down transformer and the fuses. Armoured signal cable takes the supply

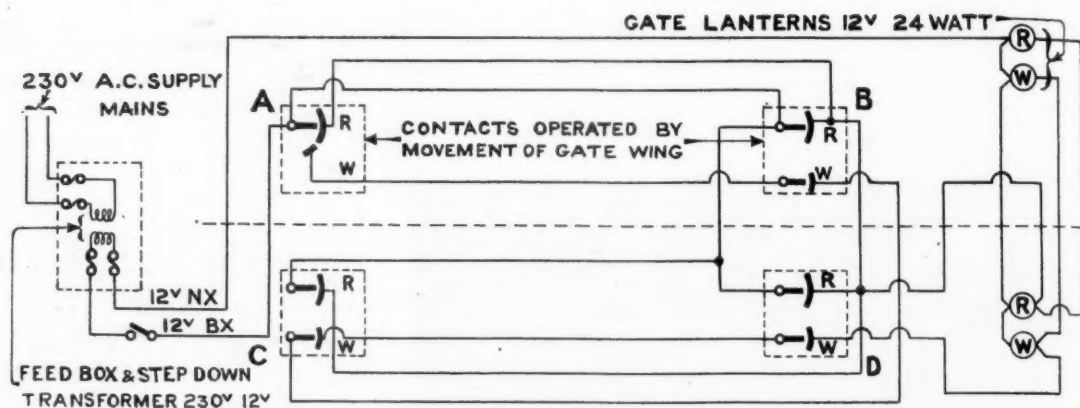


Diagram of circuits for automatic crossing-gate lamps

from the box to the four gate contacts. A switch is provided near the gate lodge to cut out the lamps during daylight. The oil lamps and mechanical cowering arrangements have been retained to cover a temporary supply failure or a blown fuse and are stored in the gate lodge. The installation was designed and the apparatus manufactured in the signal workshops at Ajmer.

Level crossing gates are secured by a clamp latching arrangement, and, where interlocked, an Annett's lock is fixed to

one gate each side of the track. The other key, in the case of double gates—or gate post in the case of single gates—is shackled so that the gates have to be closed before it can be inserted. The insertion and turning of the key releases another key in the lock. One key comes from each gate and releases the lever frame permitting signals to be lowered.

The gates of the interlocked level crossings require special maintenance. They must be level and the gate clamps

working properly. The roadway must also be kept free from obstructions so that the gates fit into their stops correctly when opened. There is a tendency for a gateman not to use the clamp so that the weight of the gate comes on to the shackled key and causes it to bend. Most of the interlocked gates now have the shackled key secured to the gate clamp so that the gateman is compelled to drop the clamp down (or in some cases operate the gate bolt) before the shackled key can be operated in the lock.

New Motive Power Shed at Carnforth, L.M.S.R.

Traffic working speeded up and economies effected



Staff office at the new Carnforth depot

AT one time Carnforth had three motive power sheds, namely, an L.N.W.R., a Midland, and a Furness Railway, but after the amalgamation in 1923 the Furness shed was closed in the interests of economy, and the staff and engines transferred to the two remaining sheds.

By 1935 it was necessary, however, to facilitate the working of traffic and effect further economies, and with this object in

view plans were drawn up for a depot to be built on the site of the old Furness shed, which was demolished for the purpose. Although the war delayed the erection of this new shed, 322 members of the Carnforth motive power depots were transferred to the new premises some months ago, and the old L.N.W.R. and Midland sheds were closed.

In the new shed there are independent

entrance and exit roads at the north end to the Barrow and Leeds lines, and at the south end to the Euston-Carlisle line. Engines entering the yard at the south entrance proceed to the water column, and, after taking water, to the coaling plant and thence to the ashpit for disposal duties. On completion of these duties the engine is turned and stabled. Engines entering at the north entrance proceed by a through line to the water column at the south end. The shed is of the through type, and it has six roads with pits. Offices and stores are adjacent.

The water supply originates from the Lancaster & Kendal Canal and is treated at a water-softening plant before being pumped to the main storage tank of 75,000 gal. capacity. An electric booster pump increases the pressure on the shed mains to 60 lb. per sq. in. for washing out purposes.

Coaling Plant Capacity

The coaling plant has two bunkers of 75 tons capacity; each bunker has jigger feeds to both coaling roads, so that passenger or freight engines can take the appropriate grade of coal. The plant is fed by a wagon hoist, and a movable flap directs the coal into the hopper required. There is stacking ground for 4,700 tons of coal at the south end of the yard.

Ashpit facilities are ample. There are two pits, 162 ft. and 126 ft. in length respectively, provided with hopper tubs in the pit and on the pit side; these are carried on narrow-gauge rails. An ash-lifting plant to both pits ensures the speedy loading of ashes into rail wagons. A 70-ft. turntable provides for the turning of the largest L.M.S.R. locomotives and this turntable is equipped with vacuum tractor apparatus.

Electric lighting plug points are provided to each of the six roads and folding doors

(Continued on page 410)

New Motive Power Shed at Carnforth



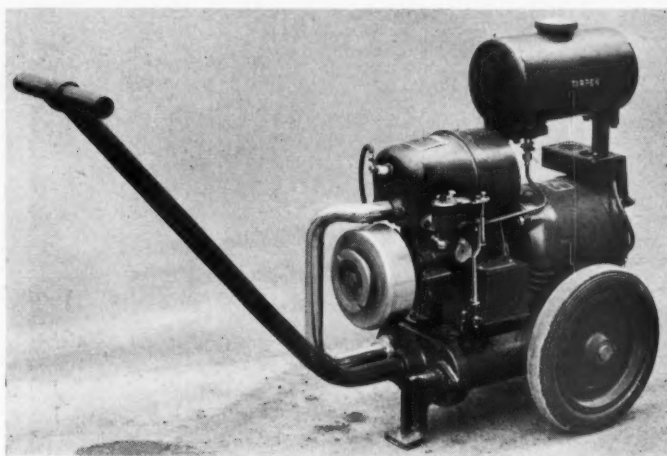
A view of the new motive power shed at Carnforth, L.M.S.R., taken from the top of the coaling plant, and showing the independent entrance and exit roads



Another photograph of the motive power shed at Carnforth showing the coaling plant in the foreground and the new office building on the right

Power-Driven Hand Tools for the Civil Engineer's Department—1

A Petrol-electric set and portable hedgetrimmer



Portable 400-watt petrol-electric set

PORTABLE power-operated hand tools are being used increasingly for railway work both indoors and out. Numerous examples of such tools were shown in an exhibition arranged recently at Kings Cross by the Chief Engineer's Department, L.N.E.R., and briefly described in our December 28, 1945, issue. It often hap-

pens that electrically-operated devices have to be used in places where no mains supply is available, and it is to meet such situations that the portable generating plant illustrated has been designed by the British Equipment Co. Ltd., Ixworth Place, London, S.W.3.

The set provides a d.c. output of 110 V.,

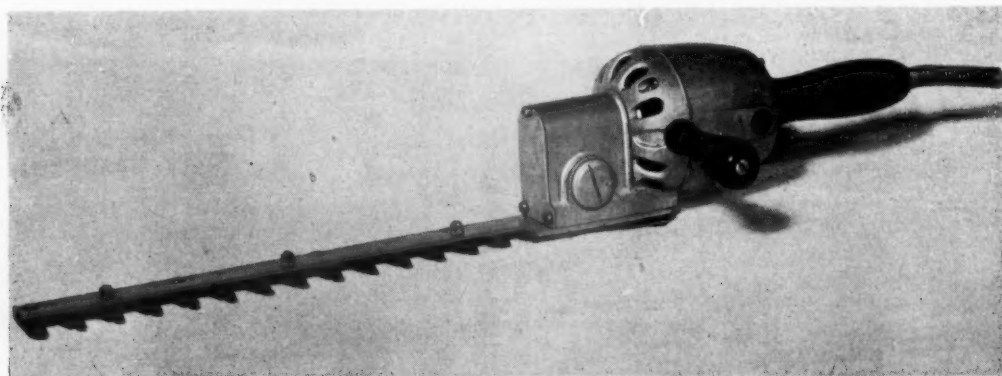
400 watts. It is powered by a single-cylinder two-stroke engine of the maker's own design, with patent pressure lubrication. Starting is by means of a rope and pulley. The engine speed is mechanically governed to maintain the correct voltage output from the generator.

The generator is totally enclosed and provided with a fan for cooling. It is directly driven from the engine through a flexible coupling. A switchbox with on-off switch and output socket is provided. Although primarily designed for supplying small power-operated tools, the set can be used for lighting in emergency.

The petrol tank has a capacity of one gallon, and the engine consumes one pint an hour on full load.

Certain tools by their nature have to be used in the open, and in situations where an electric supply is unlikely to be available. A typical example is the portable hedgetrimmer illustrated, which is suitable for operation from the petrol-electric set described above. The hedgetrimmer, which has a cutting length of 12 in., weighs only 7 lb., and in addition to being easy to operate permits one man to do as much work as eight skilled men using hand shears. At the same time the quality of work is higher.

The trimmer is provided with a universal type motor, permitting it to operate from a.c. or d.c. supplies. A 110-volt or 230-volt model can be supplied. The 110-volt trimmer can be worked off the petrol-electric set already described, or off 230-V. mains via a small transformer. The use with mains of the 110-V. trimmer and transformer is recommended, to minimise risk of shock when working in the open in damp conditions.



Portable electric hedgetrimmer for lineside work. The tool can be operated from the mains or from the petrol-electric set shown above

New Motive Power Shed at Carnforth, L.M.S.R.

(Concluded from page 408)

are situated at each end of the repair roads. The building is lighted throughout by electricity, and arrangements are in hand for the provision of two of the engine repair pits to have fluorescent lighting installed in the pit walls, and for fluorescent lighting trolleys to be supplied for the external examination of engines requiring maintenance or repair.

Ample accommodation is provided in the general stores and an electric pump is installed to pump the oil from barrels into

the storage tanks. The machine shop is equipped with the usual appliances, including a wheel lathe with journal-skimming attachment, and an overhead traverser is provided to convey wheels from the wheel drop to the lathe. The drop pit is of the hydraulic type and has a capacity for wheels 6 ft. 9 in. dia. Extension pieces are provided to enable an engine bogie to be dropped complete.

The offices, stores, etc., are centrally heated by means of a coke-fired boiler, and an independent boiler is provided for the domestic hot water supply. The ambulance room is provided with a bed and ample first-aid equipment, and there is a large staff canteen adjacent to the shed which

provides hot meals and snacks for the staff and employees.

NEW TECHNICAL SERVICE FOR INDIAN STEEL TUBE USERS.—To provide a technical advisory service for Indian industrial users of British precision steel tubes, the Tube Investments group of engineering industries has appointed Mr. J. D. S. Muirhead, formerly Director of Machine Tool Control to the Indian Government, as Resident Technical Adviser and representative through India. Two Indian technicians are to be appointed as consultants for the advisory service, and will visit Great Britain to study steel-tube production at the Birmingham tube mills.

RAILWAY NEWS SECTION

PERSONAL

Sir John Anderson, who recently was re-elected a Director of the Employers' Liability Assurance Corporation Limited, has been appointed Deputy-Chairman. He is a Director of the Southern Railway Company, and of the Canadian Pacific Railway Company.

Dr. Manoel de Azevedo Leao, who has been General Manager of the Great Western of Brazil Railway since 1936, has relinquished that post on being appointed a Local Director of the company in Rio de Janeiro. His position was assumed on March 18 by Mr. R. H. Dobson, Traffic Manager since 1936.

Monsieur Rongvaux is Minister of Communications in the new Belgian Cabinet.

Sir Arthur Street, Permanent Secretary of the Control Office for Germany & Austria, has been appointed Vice-Chairman of the National Coal Board. Sir Gilmour Jenkins, Joint Deputy-Secretary of the Ministry of Transport, will succeed Sir Arthur Street as Permanent Secretary of the Control Office for Germany & Austria.

We regret to record the death on April 10 of the Rt. Hon. Viscount Southwood of Fernhurst, Chairman of Odhams Press Limited, and Chairman of the Red Cross Penny-a-Week Committee of H.R.H. the Duke of Gloucester's Fund.

Sir Drummond Shiels has been appointed Public Relations Officer to the Post Office, in succession to Brigadier G. C. Wickins, retiring shortly.

We regret to record the death on March 31, at the age of 70, of Sir John Maxwell, C.M.G., who retired at the end of last year from the positions of Regional Transport Commissioner, Northern Region, and Chairman of Traffic Commissioners for the Northern Area.

Sir Cecil Weir, Director-General of Equipment & Stores, has been released from the Ministry of Supply. On the amalgamation of the Ministries of Supply and of Aircraft Production on April 1, Sir W. Lindsay Scott relinquished his appointments as Second Secretary in each Ministry, and retired from the public service. The following also have been released from those Ministries, from March 31:—Mr. Ben Adam, Director of Civil Engineering (Special), on his return to industry; Mr. K. G. Lampson, Deputy Iron & Steel Controller, to return to his company (Mr. Lampson continues to act in an advisory capacity to the Controller); and Mr. S. F. Steward, Director-General of Machine Tools, to return to industry.

At the last meeting of the board of the British Thomson-Houston Co. Ltd., Mr. H. Jack, Chief Electrical Engineer, Mr. A. A. Pollock, Chief Mechanical Engineer, and Mr. L. J. Davies, Head of the Research Laboratory, were elected Directors.

Mr. David Blee, M.Inst.T., Principal Assistant to Chief Goods Manager, Great Western Railway, who has been appointed Chief Goods Manager, is 46 years of age, and joined the company in 1916. After a break of two years with H.M. Forces, he gained valuable experience of all phases of the administrative work of the department as secretary successively to the Rates Manager (the late Mr. F. B. Mortimore) and to two former Chief Goods Managers

ber, 1942, with special duties which included a re-organisation of the company's road transport, and Principal Assistant to Chief Goods Manager in October last year.

Mr. H. G. R. Lambert, General Manager, East Midland Motor Services Limited, has been appointed General Manager, North Western Road Car Co. Ltd., in succession to Mr. J. W. Womar, as from a date to be agreed. Mr. A. S. Woodgate, Chief Engineer, North Western Road Car Co. Ltd., has been appointed Chief Engineer, Ribble Motor Services Limited, in succession to Captain H. L. Betteridge.

Rendel, Palmer & Tritton has taken into partnership the following members of its staff, who have been with the firm from eight to 24 years: Messrs. A. J. Clark, F. A. Greaves, E. Bateson, J. Cuerel, and J. E. G. Palmer. The following two senior members of the staff have been appointed Consultants: Messrs. A. T. Best and B. P. Ellis; also Mr. P. Hackforth, late Chief Engineer, East Indian Railway, has joined the firm as a Consultant. The firm will continue to practise under the name of Rendel, Palmer & Tritton.

L.P.T.B. STAFF CHANGES

Mr. Evan Evans, Operating Manager (Railways), will retire from the service of the Board on July 1.

Mr. A. B. B. Valentine, Chief Commercial Officer, will succeed Mr. Evan Evans.

SOUTHERN RAILWAY APPOINTMENTS

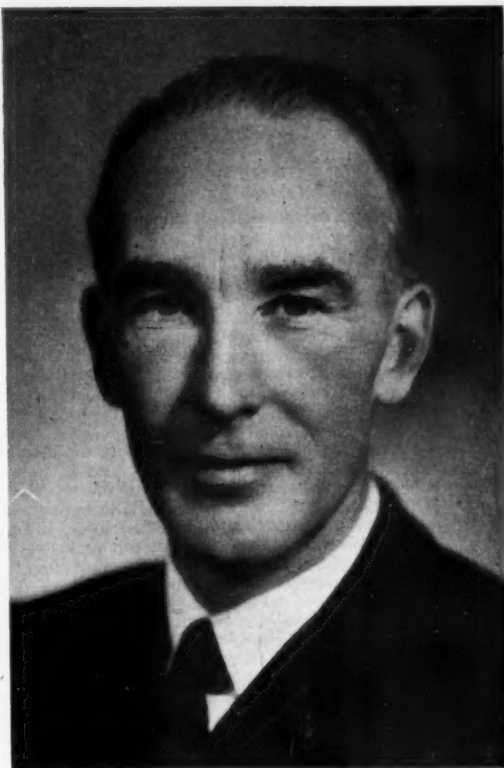
Police Department

Mr. W. E. N. Growdon to be Deputy Chief of Police, Waterloo.

Traffic Department

Mr. J. H. Brown and Mr. G. L. Nicholson to be Outdoor Assistants to Superintendent of Operations, Waterloo.

Mr. C. Furber, M.Inst.T., Mineral Traffic Manager & Development Agent, Great Western Railway, who, as recorded in our April 5 issue, has been appointed Deputy Chief Goods Manager & Mineral Manager, was born in March, 1889. He entered the company's service in 1904 in the London District Goods Manager's Office, and, after serving in various sections, was transferred in 1914 to Southall Goods Station, where he acquired much practical experience. Towards the end of 1916 he was promoted to the General Manager's Office, during his ten years in which he acted as Personal Clerk to the General Manager and was in charge of the General Section. He represented the General Manager on a number of staff investigation committees, acted as Secretary to the Clerical Work Committee, and was closely associated with important proceedings before the Railway Rates Tribunal. In 1926 Mr. Furber returned to the London District Office as Assistant, a position which he occupied until 1930, when he was appointed Chief Clerk to the Chief Goods Manager and Secretary to the Great Western Goods Conference. In 1931 he was deputed to represent the G.W.R. at functions in France connected



Mr. David Blee

Appointed Chief Goods Manager,
Great Western Railway

(the late Mr. E. Ford and Mr. A. Maynard). He gained academic distinctions at the London School of Economics in Railway Law, Railway Commercial & Operating Economics and in Railway Statistics. He has occupied successive posts as Goods Agent, Slough; Chief Clerk, Exeter District; Assistant London District Goods Manager; and District Goods Manager in turn of the Shrewsbury, Liverpool and Birmingham & South Staffordshire Districts. He was a lecturer in Railway Salesmanship and an active member of the G.W.R. London and Birmingham Debating Societies. Mr. Blee has been a member of the Shrewsbury, Liverpool and Birmingham Chambers of Commerce; Liverpool, Manchester and Birmingham & South Staffordshire Inter-Railway Conferences; Liverpool Port Emergency Committee; Dee Catchment Board; Midland Regional Canal Conference; West Midland Regional Road-Rail Conference; Employers' Panel, Ministry of Labour; and Railway Liaison Officer to various Government departments. He was appointed Assistant to Chief Goods Manager, G.W.R., in Octo-



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Mr. C. FurberAppointed Deputy Chief Goods Manager
& Mineral Manager, G.W.R.

with the company's cross-channel business, and later was made Assistant Mineral Traffic Manager. In 1933 he was appointed Mineral Traffic Manager, and in July, 1942, Mineral Traffic Manager & Development Agent. Mr. Furber, who is a member of the Birmingham Coal Exchange, the American Chamber of Commerce in London and the Transportation Committee of the London Chamber of Commerce, was Chairman of the Mineral Managers' Conference of the Railway Clearing House in 1935 and 1938. In December, 1940, he was made a member of the executive sub-committee of the Lord President's Coal Committee, and later served on the Mines Department Transport Committee. Mr. Furber represents the G.W.R. on the Mineral Committee of the Railway Executive Committee, the Joint Goods & Mineral Committee, the Continental Traffic Managers' Committee, the Near Continental Section

**Rai Bahadur A. Bholanath**Chief Commercial Manager, Bengal Assam Railway,
who has retired from the Chairmanship of the
Commercial Committee for Interchange, I.R.C.A.

of the United Kingdom Chamber of Shipping and the Advisory Committee of Traders & Railways dealing with questions affecting the Distributive Coal Trade under the Demurrage Order, 1939.

Rai Bahadur A. Bholanath, Chief Commercial Manager of the Bengal Assam Railway, who has retired from the office of Chairman of the Commercial Committee for Interchange of the Indian Railway Conference Association, is the first Indian to have been elected to that office. During his term he presided over a number of important deliberations of the committee, some having a direct bearing on the post-war policy of the Indian railways (notably that relating to the post-war rating policy, which aimed at providing a simplified rates structure to suit the industrialisation and trading requirements of the country). Rai Bahadur Bholanath joined the Indian State Rail-

**Mr. H. G. Sayers**Appointed Superintendent (Scottish Area),
L.N.E.R.

ways in 1914, on the North Western Railway. After working on that system and on the old Oudh & Rohilkhand Railway, he went in 1924 to the former Eastern Bengal Railway (now part of the Bengal Assam Railway). Rai Bahadur Bholanath held a number of responsible posts, including that of Deputy General Manager (Personnel), before being appointed Chief Commercial Manager, his present position, in 1944.

Mr. H. G. Sayers, M.B.E., Assistant Superintendent (Scottish Area), L.N.E.R., who, as recorded in our March 8 issue, has been appointed Superintendent (Scottish Area), joined the former North Eastern Railway at Hull in 1907, and was employed at the Hull West goods sheds, and Stationmaster's Office, Paragon Station, until 1909. He then was transferred to the Staff Section of the District

**Mr. Walter Gott**Commercial Advertising Officer,
L.P.T.B., 1942-46**Lt.-Colonel W. Wallace**Appointed Railway Advisor to the Greek
Government, British Economic Mission**Mr. Herbert Beasley**Appointed Commercial Advertising
Officer, L.P.T.B.

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Superintendent's Office, Hull, where he remained until the outbreak of the 1914-18 war, in which he served with the Royal Engineers in Egypt and Palestine and was mentioned in despatches. On demobilisation he returned to the District Superintendent's Office, Hull, and he was transferred as Chief Staff Clerk in the District Superintendent's Office, Sunderland, L.N.E.R., in 1923. In the next year he moved to headquarters at York, and was employed as Head of the Staff Section, Superintendent's Office, from 1927 to 1929, when he was appointed Assistant District Superintendent, Sunderland. After serving as Dock Superintendent, Tyne Dock (1932-33) he was transferred to Eastern Docks, Hull, in a similar capacity, with charge of the Alexandra and King George Docks, and oil-loading jetties at Salt End. In 1937 he was promoted Assistant Superintendent (Southern Scottish Area), and on amalgamation of the Southern and the Northern Scottish Areas in 1939 he became Assistant Superintendent (Scottish Area). Mr. Sayers was made an M.B.E. in 1943.

Mr. Walter Gott, O.B.E., Commercial Advertising Officer, L.P.T.B., who, as recorded in our March 22 issue, retires on April 17, began work as a junior clerk with the Great Northern Railway at Bradford in 1897. He worked subsequently in the District Superintendent's Office, Leeds, and in 1903 won the Lord Rosebery Gold Medal—competed for by all members of the G.N.R. staff—for submitting the best suggestion for effecting an improvement to the railway. In 1904 Mr. Gott went to the General Manager's Office, Kings Cross. His introduction to advertising work was in 1906, when he was appointed Advertising Manager. Later that year he became Passenger Agent to the Great Northern, Piccadilly & Brompton Railway (now known as the Piccadilly Line), and in 1907 he joined one of the predecessors of the L.P.T.B.—the London Electric Railway—as Passenger Agent. In 1912 he transferred as Railway Manager to the Partington Advertising Co. Ltd., which then was the advertising contractor to some of the Underground group companies. During the 1914-18 war Mr. Gott was a Captain in the Royal Engineers, and became Statistical Officer in the Shipbuilding Branch of the Admiralty in 1918, for which work he was made an O.B.E. In 1922 he rejoined the Underground group of railway companies as Commercial Advertising Officer (Railways) to form a department to take over the commercial advertising work previously carried out by contractors. He held that post until 1942, when he was made responsible for the whole of the commercial advertising work of the L.P.T.B., with the title of Commercial Advertising Officer.

Lt.-Colonel W. Wallace, late Royal Engineers, who, as recorded in our April 5 issue, has been appointed Railway Adviser to the Greek Government in the British Economic Mission, was formerly a Section Engineer, Tanganyika Government Railways. He served subsequently in the Transportation Directorate, Sudan, and as A.D.Tn., East Africa Command, and in North West Europe. For the last eight months he has been a member of the Anglo-U.S. Transportation Facilities Mission in Greece.

Mr. Herbert Beasley, who, as recorded in our March 22 issue, succeeds Mr. Gott as Commercial Advertising Officer, L.P.T.B., has been prominent in Fleet

Street activities for a number of years. He has served on the Council of the Periodical & Trade Press Association, and on the Newspaper Proprietors' Association, and has been on the Council of the Advertising Association of Great Britain & Northern Ireland for the past 12 years. He is a member of the Royal Institute of International Affairs. In 1927 he was transferred from the managerial side of the *Daily Express* to the *Evening Standard*, as Advertisement Director, a position which he occupied until 1940. During the war, the *Evening Standard* advertisement department was merged with that of the *Daily Express*; and Mr. Beasley then became Advertisement Director of a group of George Newnes Limited magazines.

L.N.E.R. STAFF CHANGES

Mr. E. O. Wright, Stationmaster, York, has been appointed Depot Agent, Darlington.

Mr. E. H. Fowler, Stationmaster, Hull, is retiring.

We regret to record the death on April 2, at the age of 74, of Mr. T. S. Sheldrake, until the end of last year Editor of *The Times Trade & Engineering*.

L.M.S.R. STAFF CHANGES

Mr. H. G. N. Read, Assistant to Chief Commercial Manager (Passenger), Watford H.Q., to be General Assistant to Chief Commercial Manager, Watford H.Q.

Mr. A. Jones, Assistant (Passenger Rates & Fares), Chief Commercial Manager's Office, Watford H.Q., succeeding Mr. H. G. N. Read as Assistant to Chief Commercial Manager (Passenger), Watford H.Q.

Mr. L. C. Purkess, Deputy Chief Passenger Rates & Charges Clerk, Chief Commercial Manager's Office, Watford H.Q., to be Assistant (Passenger Rates & Fares), Chief Commercial Manager's Office, Watford H.Q.

Mr. S. H. Gould, Chief of Divisional Trains Office, Office of Divisional Superintendent of Operation, Crewe, to be Assistant, Passenger Services, Chief Operating Manager's Office, Watford H.Q., in place of Mr. A. C. F. Calladine, appointed to special duties.

Mr. S. O. Screen, Chief of Divisional Trains Office, Office of Divisional Superintendent of Operation, Manchester, succeeding Mr. S. H. Gould as Chief of Divisional Trains Office, Office of Divisional Superintendent of Operation, Crewe.

Mr. A. Wood, District Controller, Preston, to be Chief of Divisional Trains Office, Office of Divisional Superintendent of Operation, Manchester.

Mr. F. J. Hibbert, Assistant (Freight Services), Chief Operating Manager's Office, Watford H.Q., to be Assistant District Operating Manager, Leeds, in place of Mr. A. H. Madden, detached for special duties.

Mr. J. A. C. Picknell, District Controller, Willesden, succeeding Mr. F. J. Hibbert as Assistant (Freight Services), Chief Operating Manager's Office, Watford H.Q.

Mr. C. J. Vidal, District Goods & Passenger Manager, Motherwell, to be District Operating Manager, Preston.

Mr. J. Killin, Assistant to Commercial Manager (Passenger), Glasgow, to be District Goods & Passenger Manager, Motherwell, in place of Mr. C. J. Vidal.

Mr. C. Morrison, District Controller, St. Rollox, succeeding Mr. J. Killin as Assistant to Commercial Manager (Passenger), Glasgow.

Mr. G. F. Dingley, Chief Passenger Trains Clerk, Office of Divisional Superintendent of Operation, Crewe (located at

Euston), to be Assistant District Operating Manager, London (Western).

Mr. J. Greenwood, Assistant District Controller, Willesden, to be Assistant District Operating Manager, London (Western).

Mr. D. S. Bolton, Senior Clerk (Freight Services), Chief Operating Manager's Office, Watford H.Q., to be Assistant to District Operating Manager, London (Western).

Mr. E. E. Reynolds, Chief Staff Clerk, District Goods Manager's Office, Birmingham, to be Assistant District Goods & Passenger Manager, Stoke, in place of Mr. A. E. Wilson, retiring.

Mr. F. T. Humphreys, Chief Commercial Clerk, District Goods & Passenger Manager's Office, Stoke, to be Assistant to District Goods & Passenger Manager (Commercial), Stoke.

Mr. D. Richards, Chief Accounts Clerk, District Goods Manager's Office, Wolverhampton, to be Goods Agent, Albion, in place of Mr. A. T. L. Reed, resigned.

Mr. H. A. Mugliston, Chief Transit & Station Working Clerk, District Goods & Passenger Manager's Office, Bristol, to be Goods Agent, Evesham, in place of Mr. C. H. Callimore, promoted.

Mr. J. Houghton, Head Office Inspector (Freight Services), Office of Divisional Superintendent of Operation, Crewe, to be Assistant to District Operating Manager, Liverpool.

Mr. R. M. Bradshaw, Head Office Inspector (Freight Services), Office of Divisional Superintendent of Operation, Derby, to be Assistant to District Operating Manager, Leeds.

Mr. J. E. Weatherhogg, Assistant District Controller, Skipton, to be Assistant to District Operating Manager, Leeds (located Skipton).

Mr. E. Lees, District Controller, Lancaster, to be District Controller, Wigan, in place of Mr. F. Taylor, retiring.

Mr. F. Farmer, Assistant District Controller, Lancaster, succeeding Mr. E. Lees as District Controller, Lancaster.

Mr. C. S. Drummond, Assistant District Controller, Willesden, to be Yardmaster, Willesden.

Mr. G. H. Thorpe, Assistant District Controller, Rotherham (Masborough), to be Yardmaster, Grimsthorpe.

Mr. A. J. Pickthorne, Stationmaster, East Ham, to be Stationmaster, Gloucester (also in charge of Haresfield), in place of Mr. H. J. King, retired.

Mr. T. Tracy, Assistant Power House Superintendent, Chief Mechanical Engineer's Department, Derby, to be Power House Superintendent, Chief Mechanical Engineer's Department, Derby, in place of Mr. S. J. R. Allwood, promoted.

Mr. W. Bridges, Signal Inspector, Signal & Telegraph Department, Barking, to be Area Technical Assistant, Signal & Telegraph Department, Sheffield, in place of Mr. H. W. Holt, retiring.

Mr. J. Dutton, District Foreman, Carriage & Wagon Department, Kentish Town, to be District Foreman, Carriage & Wagon Department, Willesden, in place of Mr. J. Munk, retired.

Mr. T. R. McRae, Docks & Harbour Assistant, Chief Engineer's Department, Fleetwood, to be Assistant to District Engineer, Lancaster, in place of Mr. E. T. Hannam, retiring.

Mr. C. D. Suffolk, Surveyor, Chief Engineer's Department, Watford H.Q., succeeding Mr. T. R. McRae as Docks & Harbour Assistant, Chief Engineer's Department, Fleetwood.

Mr. A. Fisher, District Permanent Way Inspector, Farnley & Wortley, to be Chief Permanent Way Inspector, Low Moor, in place of Mr. H. Ashcroft, retired.

Gauge and Tool Exhibition at Coventry



Gauge and measuring instrument section of exhibition

An exhibition of precision measuring instruments, gauges, and machine tools is now being held at the main works of the Coventry Gauge & Tool Co. Ltd., Fletchamstead Highway, Coventry, and will remain open until April 19 or possibly a later date. The exhibition is particularly opportune in view of the present demand for machine tools from abroad, and demonstrates that British technique in instrument and tool design is able to fulfil and improve on all the demands that in the past have been met by the specialised products of countries where manufacture has now been interrupted by the war.

In addition to the Matrix products of the Coventry Gauge & Tool Co. Ltd., the exhibition includes various measuring instruments, particularly optical types, manufactured by other firms associated in the British Engineers' Small Tools & Equipment Co. Ltd. The latter organisation promotes the export trade of its members and has appointed agents in numerous Continental and overseas countries.

The Coventry Gauge & Tool Co. Ltd. supplied 90 per cent. of the gauges required for the war effort. Precision measuring instruments therefore form an

important part of the present exhibition. The firm is showing a Matrix thread-measuring machine made to National Physical Laboratory design, and supplied with a set of prisms for which N.P.L. certificates can be issued if desired. This machine incorporates a micrometer with a non-rotating anvil, ensuring consistency of reading since measurement is always taken to the same point on the anvil and the possibility of grit or dust affecting the readings at some stages of adjustment is avoided.

Examples of the Matrix 3-point internal or external caliper gauges are also exhibited. These are characterised by accuracy and rigidity of construction, and ease of application to the work while it is on the machine. The calipers are simple to use, and capable of being operated by unskilled labour. For measuring tapered parts, the firm is exhibiting a taper measuring machine made to N.P.L. designs, with a micrometer graduated to read in thousandths of an inch, the indicator giving a magnification of movement of approximately 350 to 1.

A simple and accurate method of checking the accuracy of gearwheel teeth is pro-

vided by a pantagraph which traces superimposed outlines of the teeth on a smoked glass screen, from which the diagram can be projected and magnified. Discrepancies are thus immediately apparent without the use of a template.

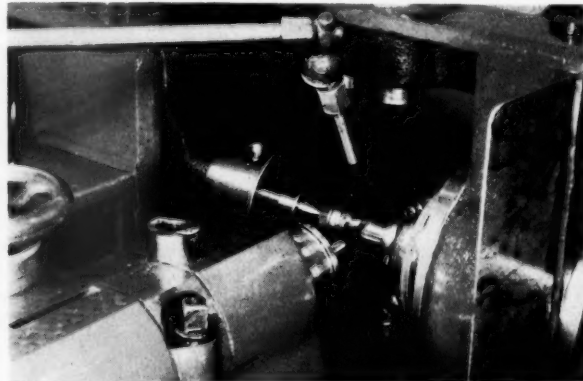
Among the optical measuring instruments in the exhibition is a Matrix comparator for testing the flatness of gauges. Easy reading is provided by a magnifying mechanism which causes a shadow hairline to move across a wide and easily-read scale calibrated in millionths of an inch.

Sets of Matrix and Wickman thread and plain gauges, and specimen broaches, are also displayed. One of the broaches shown has a 20 B.A. thread.

In the machine tool section of the exhibition, the company is showing a machine developed for a particular and complex wartime requirement. This is a three-dimensional cam milling machine. When the need for this arose, no standard machine for the purpose was available, and the present tool is the result of some intensive and original development work by the company's engineers. The master cam is three times the size of the product cam, enabling a rigid follower with adequate bearing surface to be used in the interests of accuracy. Apart from its specialised function, the machine is applicable to the quantity production of irregularly shaped components. In connection with it, the firm has designed an optical cam measuring machine, also applicable to the precise measurement of irregular parts.

An important development in thread grinding machines shown in the machine tool section is a Matrix universal thread grinding machine with multi-ribbed wheel, capable of producing single or multiple right or left hand threads of any pitch up to 60 T.P.I. Any type of thread can be produced according to the shaping of the wheel, which can be varied by means of Matrix diamond dressers pressed against the wheel by suitable cams.

An addition to the Matrix range of thread grinders is the No. 33 high precision bench machine for work up to 4 in. between centres with a maximum diameter of $\frac{1}{2}$ in. The machine can be mounted either on a bench, or on a specially designed base occupying a floor space of approximately 2 ft. 4 in. by 3 ft. 3 in.



Left—Matrix three-dimensional cam-milling machine, suitable for the quantity production of irregularly shaped components

Above—View of cutter, showing cam in course of production

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International Trains of the S.N.C.F.

A summary of the through services restored to the present time

The French National Railways Company (S.N.C.F.) undertook to re-establish international railway services as soon as possible after the liberation. Between May and December, 1945, international conferences were held at Lisbon, Brussels, Seville, Lugano and Paris, as a result of which a number of international trains was re-established in 1945 and others are following in the present year.

SERVICES BETWEEN FRANCE AND ENGLAND

A service three times weekly *via* Dieppe and Newhaven, with rail connections to London and Paris, was begun on January 15, 1945, and became a daily service from February 22, 1945.

The pre-war express, the "Golden Arrow," is to begin running again between Paris and Calais on April 15, maintaining a daytime service between Paris and London. The train will be made up of Pullman cars, a restaurant car, and carriages of all three classes. It will connect with the "Simplon-Orient Express," and from May 6, 1946, will convey a Calais-Nice sleeping car.

On May 6 it is hoped to restore a night train with sleeping cars between Paris and London *via* the Dover-Dunkirk train ferry, which will be placed in service for that date. The service will operate three times weekly.

"NORTH STAR" AND "NORD EXPRESS"

The "North Star" express, comprising Pullman cars and first and second class carriages, will begin running again between Paris, Brussels and Amsterdam on May 6. This train will replace the fast railcar now running between Paris and Brussels.

Negotiations are in progress with the Belgian Railways Administration for the restoration on May 6 of the "Nord Express" between Paris, Calais and Ostend on the one hand and Copenhagen and Berlin on the other, *via* Liège, Duisberg, and Hanover. This train will be made up of first and second class sleeping cars and will provide a daily service.

A night service between Paris and Mainz was restored on July 29, 1945. The trains comprise a section for Mainz and one for Spire. The service was extended to Frankfurt on January 7 this year, since when a first class sleeping car between Paris and Berlin has been included. This carriage is worked between Frankfurt and Berlin by an express run specially for the American Army. In addition, the service connects at Frankfurt with a train to and from Nuremberg.

A day service between Paris and Mainz, *via* Metz and Sarrebrück, was begun on December 3, 1945, by extending two Paris-Metz expresses to Mainz.

Since October 8, 1945, a through portion for Baden Baden, comprising a second class sleeping car and first, second and third class carriages, has been attached to one Paris-Strasbourg train in each direction.

ORIENT EXPRESS SERVICES

The "Orient Express" has been running three times a week between Paris and Vienna since April 1 this year. This train comprises sections for Prague, detached at Stuttgart; for Innsbruck, detached at Appenweier; and for Baden Baden.

The Paris-Vienna and Paris-Prague portions consist of a first and second class

sleeper and a first and second class carriage. Between Paris and Innsbruck there are two first and second class carriages.

The "Arlberg Express" was placed in service three times a week from September 27, 1945, between Paris and Innsbruck *via* Basle and Zurich. On October 12, 1945, it was extended to Vienna. From January 8, 1946, until the restoration of the "Orient Express" on April 1, it conveyed a second class sleeping car and a first and second class carriage between Paris and Prague *via* Linz. The Paris-Vienna portion comprises two sleeping cars and a first and second class carriage. The train has run daily since March 18.

The "Simplon Orient Express" was restored on January 8, 1946, for communication between France and Italy *via* Switzerland. Beginning three times weekly, it has run daily from March 18. The train connects Paris with Rome and Venice *via* Lausanne and Milan, and comprises first and second class sleeping cars between Paris and Rome, and Paris and Venice; and a first and second class carriage between Paris and Milan. From May 6 an additional first and second class carriage will be included in the Rome and Venice

portions, and a through sleeping car will run between Calais and Milan. At Brigue, it will pick up a first and second class carriage from Berne for Milan, with a similar facility in the reverse direction.

FRANCE AND BELGIUM TO SWITZERLAND

On January 8 a through train was restored in each direction between Brussels and Basle, connecting at Basle with the Swiss expresses which had been extended from Chiasso to Milan. The Brussels-Basle trains convey a through portion to and from Calais, including a sleeping car, as from April 15.

SERVICES TO SPAIN AND PORTUGAL

The Paris-Madrid and Paris-Lisbon services *via* Hendaye and Irun were resumed on January 18, 1945, but it was not until October 8, 1945, that the S.N.C.F., by running fast trains between Paris and Irun, actually re-established the service known as the "Sud-Express." Services between Paris and Barcelona, *via* Cerbère and Port Bou, were re-established on October 9, 1944.

Other international services are in view, particularly the extension of the "Orient Express" beyond Vienna to the Balkans, and the extension of the "Simplon Orient Express" beyond Venice to Belgrade and Istanbul. Two international conferences are to be held to discuss these plans.

Scientific Research and Industrial Expansion

Dr. R. E. Slade, D.Sc., M.C., lately Research Controller, Imperial Chemical Industries Limited, read a paper at the Federation of British Industries' conference on March 28, in the course of which he said: The great industries of this country were built up by our pioneers who were managers, foremen, mechanics and craftsmen of all sorts. Then the scientist and the research worker came on the scene. Perkins, a scientific research chemist, started the synthetic dye industry based upon discoveries made by scientific research. But Perkins, having made as much money as he required, retired before he was forty to the scientific work which he loved, without realising that he had sown the seed of a new technique of industrial development.

The same scientific industrial principles were used by the professors of Heidelberg University, who started a dye industry based upon laboratories where science was used in solving the works problems, and where new ideas for industrial development were born. Similar scientific organisations arose in the electrical and optical glass industries in Germany, in the engineering industry in Switzerland, and in the electrical industry in America, but in the main British industry continued to be run on the old lines. We could afford to do this because our industries were well established and still profitable. By 1914 there were good small laboratories in some of our industries, but nowhere were large laboratories researching for new industries, and few of our managers were scientifically trained.

The foreign manufacturers, who were using scientists in all branches of their organisations, became serious competitors in our markets. We did not realise the importance of this at first because in some cases their activities were in offshoots or sidelines of our industries. In the chemical industry, they made great advances in dyes and drugs, while we had to be content to leave this field to them for many

years, and we were glad to supply them with some of the raw materials of their industry.

The need for science and research in industry was first realised by us as a nation during the first world war, when the Government formed the Department of Scientific & Industrial Research to accelerate the introduction of research into industry. The research associations were started and many of them have done good work. Some of our manufacturers have established large research laboratories and have adopted the scientific industrial method. I do not know of a single case of a firm starting a large research laboratory and not making a success of it.

The problem of introducing this scientific policy into the working of smaller firms is, perhaps, more difficult, but if under present conditions the smaller firms are to originate new developments, they will have to work out some method of introducing science and research into their daily life. I am confident that this can be done. There are the research associations, and I hope that some day we shall have the equivalent of a Mellon Institute in this country, for in America it has been a most important factor in the introduction of science and research into many small and large firms.

Let us now consider how new industries arise from a research laboratory.

1. Research may be directed to supplying a well defined want or what is believed to be a want. For example, estimates were made of the future supplies of petrol, and it was agreed that there would be a world shortage in a few years. Research was commenced on all likely means of making a liquid fuel which might be used in an internal-combustion engine. Petrol was being manufactured from coal within ten years.

2. Research may produce a new device, a new chemical, or a new plastic which we think may find a use somewhere. Then there must be more research to find and

establish a market. The uses of a new material are not obvious at first. Perspex, the transparent plastic clearer than glass, used for the windows of aeroplanes, was a few years ago only an interesting curiosity. To many people it seemed unlikely that it would ever be of industrial importance. Now it is not only used for the windows of aeroplanes. It is a beautiful plastic for making mouldings of all sorts.

3. Sometimes research succeeds in lowering the cost of production of some product to such an extent that its use is considerably extended. This may amount to the making of a new industry. Ford's method of making motor-cars is an example of this. Another was the synthesis of ammonia which led to the manufacture of sulphate of ammonia on a large scale and introduced the use of nitrogenous fertilisers to farmers all over the world.

4. Research also produces new ideas which create a new kind of want, such as an electric razor, a wireless set, a new kind of drug such as sulphonamide or penicillin, or a scientific weed killer which will destroy the weeds without harming the crop.

Let us now consider what happens when we have obtained the knowledge and ideas upon which a new industry may be based. First, everyone will not recognise the possibilities, and those who do will point out the difficulties and the risks in starting to manufacture something new. If the new industry is to arise, at least one enthusiast must believe in the commercial and industrial opportunities offered. He has to obtain the confidence of his colleagues and persuade them to spend money upon the venture.

ECONOMIC INVESTIGATION INSUFFICIENT

Many of us have at one time thought that an economic investigation of the market and of costs of production would make it easy to decide whether a new industry was possible. But this is not the case. Such an investigation is useful, and must be made, but it never leads to a definite conclusion. Either there is a market, in which case a guess has to be made whether the new product will make its way by being an improvement or by being cheaper, or there is no market, and then it has to be decided whether a new market can be made.

This country has often provided the ideas upon which other countries have built up industries. We have, indeed, done more than our share of providing ideas, and we have done less than our share of making them into new industries. I think it is because we are only just adopting scientific industrial methods, but from now on I hope that we are going to develop our ideas into industries ourselves. It is being done in some of our industries now, and it has been done wherever it was needed in our war effort.

LATHE AND PLANNER TOOLS.—The British Standards Institution has issued a standard relating to the shapes of butt-welded lathe and planer tools. This standard was prepared by collaboration between the Ministry of Supply and the Welded & Brazed High Speed Tool Trade Association, and has been issued by the Institution at the request of that Ministry. The primary object is to bring about a simplification in the variety of sizes and shapes of butt-welded lathe and planer tools. Copies of the standard (No. 1296) may be obtained, price 2s. each, on application to the British Standards Institution, 28, Victoria Street, London, S.W.1.

Questions in Parliament

Assessment of Railways

Mr. Eric Fletcher (Islington East—Lab.) on March 28 asked the Minister of Health whether he contemplated introducing, before the end of the present financial year, the Bill to give effect to the Government's decision on the assessment of railways for local rates, in accordance with the intimation of that decision which had been given to the local government associations and to the railway companies.

Mr. Aneurin Bevan (Minister of Health): I regret that it will not be possible before the end of the present financial year and the beginning of the Fourth Roll period under the Railways (Valuation for Rating) Act, 1930, to introduce the Bill on which the Government has decided, but I hope to be in a position to do so early in the coming financial year. The Bill will provide that it shall take effect from the beginning of the Fourth Roll period as concerns the main-line railways and the Third Roll period as concerns the London Passenger Transport Board.

Mr. Fletcher: Is the Minister aware that, while all local authorities will welcome that announcement, there are still unsolved problems relating to the Third Roll period which might with advantage be dealt with in the proposed Bill?

Mr. Bevan: I will look into that.

Accommodation for Mothers and Children

Mr. Harold Davies (Leek—Lab.) on April 1 asked the Minister of Transport whether he was aware of the inadequate facilities provided by the railway companies for mothers who had to travel long journeys with babies or children; and if he was prepared to encourage the introduction of specially constructed coaches with suitable arrangements for proper attention to be given to the needs of the children.

Mr. Alfred Barnes: When the problems immediately arising from the war have been overcome, consideration can be given to the provision of additional facilities for mothers travelling long distances with babies or young children, for whose needs every sympathy is felt.

Sound Warning System on Railways

Mr. T. W. Stamford (Leeds West—Lab.) on March 25 asked the Minister of War Transport whether he had considered the recommendation of Lt.-Colonel Sir Alan Mount, Chief Inspecting Officer of Railways, for the adoption on all railways of the sound warning system in use on the G.W.R.; and what action he proposed to take.

Mr. Alfred Barnes (Minister of War Transport) in a written answer stated: Yes, Sir. I have asked the railway companies to give consideration to this recommendation and to furnish me with their observations.

Workmen's Tickets

Mr. George Wallace (Chislehurst—Lab.) on April 1 asked the Minister of Transport if he would ensure that workmen's tickets on suburban services be made available until 8.30 a.m. for all trains arriving at London termini.

Mr. Alfred Barnes (Minister of Transport): No, Sir. If workmen's tickets were made available until 8.30 a.m. in the London area, they would be used by many people who now take season and ordinary tickets, and the purpose of the specially low fare allowed on workmen's tickets would thus be defeated. The change might

also cause passengers who now travel before 8 a.m. to travel later, and thus lead to still greater pressure on services which at their loading peak are already heavily taxed.

Mr. Wallace: Is the Minister aware that there is a considerable social problem involved in my question? Perhaps he will be good enough to have an investigation made into the number of people who have to wait around London stations an hour or more before their offices open, because they cannot afford the cost of a season ticket?

Mr. Barnes: I am aware of that, but I would ask Mr. Wallace to study the answer I have given.

Railway Locomotives and Oil Fuel

Colonel F. J. Erroll (Altrincham—C.) on March 25 asked the Minister of War Transport what encouragement was being given to the main-line railway companies to adapt their steam locomotives to the burning of oil fuel instead of coal.

Mr. Alfred Barnes: This is a matter which has so far been left to the initiative of the railway companies. The Great Western Railway has adapted a number of freight engines to burn oil fuel and is planning to adapt some express passenger engines.

Colonel Erroll: Will the Government perhaps give some practical encouragement by abolishing the revenue duty on imported fuel oil?

Lieutenant T. C. Skeffington-Lodge (Bedford—Lab.): Taking a long view, would it not be highly undesirable for any major section of our transport system to depend entirely on fuel imported from overseas?

Mr. Barnes: We will certainly take that into consideration.

Mr. Hector Hughes (Aberdeen North—Lab.): Can the Minister say whether any of the larger locomotives have been adapted to jet propulsion?

There was no reply.

Repairs to Railway Locomotives

Mr. R. De la Bere (Evesham—C.) on March 21 asked the Minister of Labour & National Service whether, in view of the delay in effecting repairs to railway locomotives, motor vehicles and footwear, boots and shoes, special consideration would be given to those categories for release from the Forces in those cases where it could be established that the men serving were skilled and experienced in those trades.

Mr. Ness Edwards (Parliamentary Secretary to the Ministry of Labour & National Service): It is open to an employer in any of the trades mentioned to apply through the appropriate Government department for the release of a particular man in class B if he can properly be considered as an individual specialist whose services are essential for urgent work of national importance.

Spilsby—Firsby Train Service

Commander J. F. W. Maitland (Horncastle—C.) on March 18 asked the Minister of War Transport whether he was aware that a strong feeling existed among residents of Spilsby, Lincolnshire, and the surrounding district that the passenger-train service between Spilsby and Firsby should be resumed at the earliest possible moment; and when that service would be restored.

Mr. Alfred Barnes (Minister of War Transport) in a written answer stated: Yes, Sir, but having regard to the present limited resources of the railway company and to the alternative bus service available

to meet the needs of the comparatively small number of passengers in this district. I do not consider that the restoration of this service would be justified at present. The position will be reviewed when conditions improve.

Aberdeen Train Service

Mr. Hector Hughes (Aberdeen North—Lab.) on March 11 asked the Minister of War Transport if he was aware that on Saturdays the last train going south left Aberdeen at 5.15 p.m. by L.N.E.R.; and at 5.25 p.m. by L.M.S.R.; that that was prejudicial to the industrial, commercial, social and sporting interests of the city; and if he would arrange to restore at an early date the pre-war trains leaving the city on Saturdays at 7.30 p.m. and 7.45 p.m., respectively.

Mr. Alfred Barnes: I am making inquiries and will advise Mr. Hughes of the result as soon as possible.

Steamer Service Between Great Britain and Northern Ireland

Sir Ronald Ross (Londonderry—C.) on April 1 asked the Minister of Transport (1) what was the combined gross tonnage of ships now carrying passengers between Great Britain and Northern Ireland; and that of the ships normally available for that purpose in July, 1938; and (2) whether he was aware that the ships now running between Great Britain and Northern Ireland would be incapable of carrying the normal summer passenger traffic; and what steps he proposed to take to enable that traffic to be carried adequately.

Mr. Alfred Barnes: The total gross tonnage of ships carrying passengers between Great Britain and Northern Ireland is at present 24,586, compared with 48,111 in July, 1938. I hope that later this year there will be an addition to these services of three vessels totalling some 8,000 gross tons, which, after long war service, are now being reconverted and repaired. I am aware that with the lifting of restrictions of travel to Northern Ireland it is possible that tonnage may not be adequate for the traffic, but, considering the existing state of repair facilities and the acute general shortage of passenger vessels, there is little prospect of further additional tonnage being made available this year.

Sir R. Ross: Will the Minister undertake that, in catering for tourist traffic to Continental countries, he will see that it is possible for tourists to go all over the United Kingdom?

Mr. Barnes: Certainly, but Sir R. Ross should keep in mind that this service has been treated reasonably and fairly as compared with similar services.

Sir R. Ross: Is there any other service that still has half the tonnage it had in peacetime?

Mr. Barnes: Oh, yes.

Sir Ronald Ross on April 1 also asked the Minister of Transport whether he was aware that ships carrying cargo between Londonderry and the ports of Heysham and Liverpool did not run on predictable dates or at regular intervals, as they had done before the war; and whether he would now restore regularity to the running of those services.

Mr. Alfred Barnes: Sailings on the Londonderry—Liverpool service have been interrupted recently by the necessity of surveys to the vessel concerned. However, I am informed that the regular pre-war weekly service has now been resumed. The frequency of sailings on the Londonderry—Heysham service has been reduced from twice a week to three times a fortnight by the slower turn-round in Hey-

sham. The question of improving the turn-round is now under discussion between the company and the dock authorities.

G.W.R. Locomotive Stock Tables

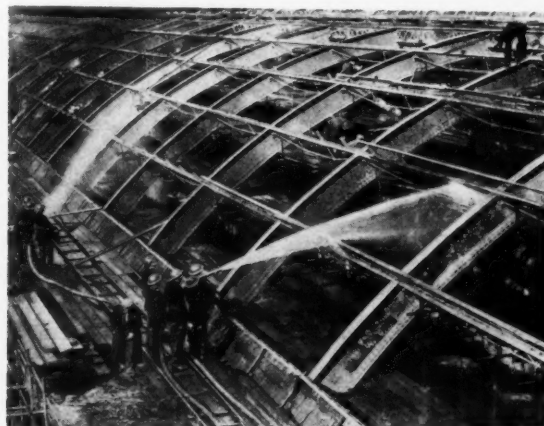
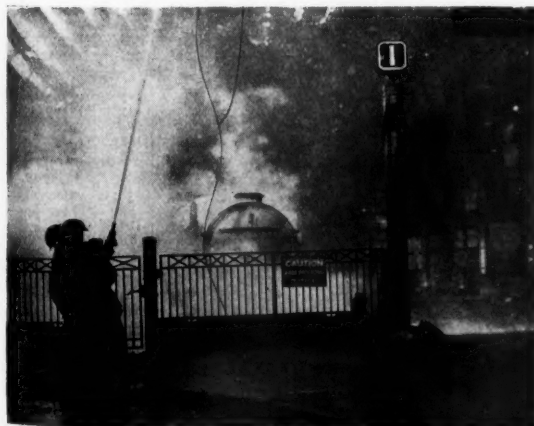
Recording the fact that April 1 this year was the centenary of the first passenger locomotive wholly built at Swindon Works being put in steam, the *Great Western Railway Magazine* publishes in its April issue a comprehensive list of names selected for engines now in service or under construction, and a table of G.W.R. locomotive stock totals by types for 1938-45. The locomotive stock table is reproduced below.

It will be seen that the number of 4-6-0 tender locomotives increased by 127 in the period covered, as a result of the general purposes engines of this wheel arrangement which have been built, including the latest "1000" or "County" class. At the same time the total of 2-6-0s, regarded as mixed traffic engines before the versatility of the larger general purpose types was so extensively exploited, has gone down by 22.

G.W.R. YEAR-END LOCOMOTIVE STOCK TOTALS, 1938-45

Type	1938	1939	1940	1941	1942	1943	1944	1945
4-6-0	511	554	569	594	609	621	632	638
4-4-0	105	93	95	95	95	95	94	90
2-8-0	161	173	190	193	226	226	226	226
2-6-0	290	271	274	274	274	274	273	268
2-4-0	3	3	3	3	3	3	3	3
0-6-0	250	253	151	171	171	170	177	175
Total tender locos.	1,320	1,347	1,282	1,330	1,378	1,389	1,405	1,400
2-8-2 T	50	54	54	54	54	54	54	54
2-8-0 T	143	141	151	151	151	151	151	151
2-6-2 T	428	441	442	442	442	442	442	442
2-4-0 T	27	27	27	27	26	26	23	16
0-8-2 T	1	1	1	1	1	1	1	1
0-6-2 T	407	405	405	405	405	405	405	402
0-6-0 T	1,123	1,153	1,195	1,214	1,243	1,271	1,281	1,269
0-4-2 T	111	111	111	111	109	109	108	104
0-4-0 T	20	20	20	20	19	19	19	19
Total tank locos.	2,310	2,353	2,406	2,425	2,450	2,478	2,484	2,458
Total steam locos.	3,630	3,700	3,688	3,755	3,828	3,867	3,889	3,858
Petrol—Oil	1	1	1	1	1	1	1	1
Service locos	6	4	4	4	4	4	4	4
Rail motors petrol	18	18	32	36	38	38	38	38

Roof Fire at Kings Cross Station, L.N.E.R.



Firemen fighting the blaze in the roof over platforms 1 to 5 at Kings Cross, L.N.E.R., on March 29 (see news paragraph in our April 5 issue)

Notes and News

Draughtsmen Required.—Senior and junior draughtsmen are required by experience in diesel locomotive design or in steam or railcar practice. See Official Notices on page 419.

Overseas Employment.—Chief permanent way inspectors are required by the Malayan Government Railways for a tour of three years in the first instance with prospect of permanency. Candidates must have had experience as gangers or sub-gangers on a British railway and have a sound knowledge of permanent way maintenance in all its aspects. See Official Notices on page 419.

St. Malo Reopened to Southern Railway Steamers.—The Southern Railway announces that, from April 16, the fortnightly steamer service at present in operation between Jersey and Granville will be discontinued and replaced by a fortnightly service between Jersey and St. Malo. The timings of the first service will be:—April 16: Jersey depart 3 p.m., St. Malo arrive 7 p.m.; April 17, St. Malo depart 7 a.m., Jersey arrive 11 a.m.

Retired Railway Officers' Society.—The Retired Railway Officers' Society held its annual ladies' afternoon at the Abercorn Rooms, Great Eastern Hotel, London, on April 2, when 57 members and their ladies met for tea and a musical programme by Pauline Stewart (soprano) and Hebe Howarth (pianiste and humorous entertainer), with Wilfred Hubbard in conjuring and memory feats. The proceedings were carried through in a happy vein under the Presidency of Mr. G. S. Szlumper, C.B.E., T.D.

Bridge Rebuilding at Kilburn, Metropolitan and Bakerloo Lines.—On Saturday evening, April 6, London Transport engineers began the complete reconstruction of the bridge which carries the northbound Bakerloo and Metropolitan tracks over the L.M.S.R. between West Hampstead and Kilburn. This bridge, built in 1879, carried both Metropolitan tracks until the lines were doubled and a new bridge was built alongside in 1914. Since the Bakerloo Line service was extended to Stanmore in November, 1939, the old bridge has carried the Metropolitan and Bakerloo down tracks, and the newer bridge has carried the up tracks. The reconstruction of the old bridge had to be postponed on account of the war. To minimise the effect on train services, the work of reconstruction will be proceeded with only at week-ends. Beginning on April 6, and every Saturday

evening and Sunday following until the work is completed, all Bakerloo and Metropolitan Line trains are being switched to run over the two tracks on the newer bridge. Dovetailing both the fast and local services on to the two tracks will necessitate a slight revision to the week-end timetables on both services. Speed restrictions will be in force which will increase the journey time between Finchley Road and Wembley Park for Metropolitan trains by 1½-2 min., and for Bakerloo trains by ½ min. Weekday services will remain as now. Timetables for the special Saturday evening and Sunday running will be displayed at stations.

F.B.I. Trade Mission to Denmark.—An industrial mission, headed by Sir Guy Locock, Vice-President, and formerly Director of the Federation of British Industries, recently arrived in Denmark to discuss with the three leading Danish industrial and commercial organisations the import requirements of Denmark and how far Great Britain can meet them. The mission has the approval of the United Kingdom and Danish Governments. The following are the members of the mission, in addition to Sir Guy Locock:—

Messrs. C. S. Bache (representing the Hardware Trade Alliance), W. A. Barclay (representing the Machine Tool Trades Association), S. Beddow (representing the Cotton Board), R. Colin Smith (representing the British Iron & Steel Federation), W. H. Craig (representing the Mining Association of Great Britain), J. Davidson Pratt (representing the Association of British Chemical Manufacturers), H. J. Lloyd (representing the Export Group of the Agricultural Machinery Implement Manufacturers), L. McClymont (representing the British Rayon Federation), T. B. C. Thorneloe (representing the Wholesale Clothing Manufacturers' Federation of Great Britain), and R. C. G. Hunt-Taylor (F.B.I.) (Secretary to the Mission).

Signalling Apparatus Exhibition at Euston.—An L.M.S.R. railway signalling demonstration was opened in the Shareholders' Meeting Room at Euston Station, London, N.W.1, on Wednesday last by Mr. Alfred Barnes, Minister of Transport. The exhibition includes a replica of a small main-line signal box with standard 15-lever frame, block instruments, and an electrically-illuminated diagram showing the lay-out of sections of line controlled. The full-size demonstration equipment controlled from this box includes a set of points, two types of semaphore signals, and a colour-light signal. Other types of modern signalling and communications equipment on exhibition include electric machinery for the operation of points,

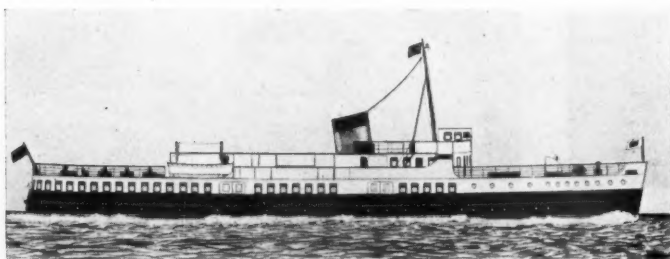
Creed teleprinters, a traffic-control keyboard, manual and automatic switchboards, electrical apparatus for the safe working of trains on single-line railways and station loudspeaker equipment. Admission is free to the exhibition, which will be open from 11 a.m. to 8 p.m. daily, except Sundays, until April 30.

L.P.T.B. Victoria Underground Station.—To assist in clearing Victoria Underground station platforms more rapidly, London Transport has opened exits at the west end of both District Line platforms

British and Irish Railway Stocks and Shares

Stocks	Highest 1945	Lowest 1945	Prices	
			Apr. 9 1946	Rise/ Fall
G.W.R.				
Cons. Ord. ...	60½	47½	55½	+ ½
5% Con. Pref. ...	124½	104½	111	—
5% Red. Pref. (1950) ...	107½	101½	103	—
5% Rt. Charge ...	137½	120	126½	—
5% Cons. Guar. ...	135½	117	121½	—
4% Deb. ...	118	106	111	—
4½% Deb. ...	119½	108	112½	—
4½% Deb. ...	124½	111½	117	—
5% Deb. ...	138	124	127	—
2½% Deb. ...	83	74½	84½	—
L.M.S.R.				
Ord. ...	33	23½	27½	— ½
4% Pref. (1923) ...	65	50	56	+ 1½
4% Pref. ...	80½	69½	78	+ 1½
5% Red. Pref. (1955) ...	106½	99½	101½	—
4% Guar. ...	106½	97	101½	—
4% Deb. ...	110½	102	105½	—
5% Red. Deb. (1952) ...	110½	103½	106½	—
L.N.E.R.				
5% Pref. Ord. ...	8½	5½	6	—
Def. Ord. ...	42	23	3	—
4% First Pref. ...	62½	49½	55½	+ 2
4% Second Pref. ...	33½	24½	28½	—
5% Red. Pref. (1955) ...	103	96	97	—
4% First Guar. ...	104½	95	99	—
4% Second Guar. ...	97	89½	90½	+ ½
3% Deb. ...	91½	82½	88½	— ½
4% Deb. ...	109½	101	105½	—
5% Red. Deb. (1947) ...	103½	100	100	—
4½% Sinking Fund Red. Deb. ...	106½	103	103½	—
SOUTHERN				
Pref. Ord. ...	79½	63	75½	+ 1
Def. Ord. ...	27	20	22½	—
5% Pref. ...	124½	104	110½	—
5% Red. Pref. (1964) ...	117	107	108½	—
5% Guar. Pref. ...	135½	117	121½	—
5% Red. Guar. Pref. (1957) ...	117	106½	108½	—
4% Deb. ...	117	104½	109	— ½
5% Deb. ...	137	124	126½	—
4% Red. Deb. (1962- 67) ...	112	104½	106½	—
4% Red. Deb. (1970- 80) ...	113½	104	107½	—
FORTH BRIDGE				
4% Deb. ...	106	103	103	—
4% Guar. ...	106	101	102	—
L.P.T.B.				
4½ "A" ...	125	117	123½	—
5% "A" ...	135	127	133½	—
3% Guar. (1967-72) ...	100	97½	102	—
5% "B" ...	125½	115	117½	—
5% "C" ...	70	58	57	+ 1
MERSEY				
Ord. ...	37	31½	31	—
3% Perp. Pref. ...	72½	68½	71	—
4% Perp. Deb. ...	104½	104	103	—
3% Perp. Deb. ...	84	78½	81	—
IRELAND*				
BELFAST & C.D.				
Ord. ...	8½	6	7½	—
G. NORTHERN				
Ord. ...	34	24½	38½	—
Pref. ...	52½	42½	59½	—
Guar. ...	80	68	85½	—
Deb. ...	97½	87½	101	—
IRISH TRANSPORT				
Common ...	—	—	17/3	—
3% Deb. ...	—	—	101½	+ ½

* Latest available quotation



The Southern Railway has placed an order with William Denny & Bros. Ltd., Dumbarton, for two passenger vessels to operate between Portsmouth and the Isle of Wight. These vessels will be driven by geared diesel engines with twin screws, and they will have a gross tonnage of 1,100 and accommodation for 1,400 passengers

OFFICIAL NOTICES

DRAUGHTSMEN wanted. Senior and Junior draughtsmen with experience in Diesel locomotive design or in steam or railcar practice required. Progressive positions for keen men. Please send particulars of age, salary and when free, to Box 5, *The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

CIVIL ENGINEERING ASSISTANTS (Senior and Junior), experienced in surveying and levelling, design of structures, railway layouts, contract documents and bills, etc., required by Main Line Railway Company.

Engagements on temporary basis at from £7 7s. to £10 10s. per week, plus War Advance (at present 28s. per week), according to qualifications and experience.—Applications, stating age, experience, etc., with copies of recent testimonials, to Box No. 293, c/o *The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

OVERSEAS EMPLOYMENT: CHIEF PERMANENT WAY INSPECTORS required by the Malayan Government Railways for a tour of 3 years in the first instance with prospect of permanency. Salary: \$325, rising to \$500 a month, and children's allowances \$30 a month for the first child and \$20 a month for the second. Free passages and quarters. Outfit allowance £30. (Malayan dollar = 2s. 4d.) Candidates must have had experience as Gangers or Sub-Gangers on a British railway and have a sound knowledge of permanent way maintenance in all its aspects. Written applications (no interviews), giving the following essential details: (1) Full name; (2) date of birth; (3) qualifications and experience; (4) name and address of present employers; (5) details of present work; should be sent to the Secretary, Overseas Manpower Committee (Ref.: 5652C), Ministry of Labour and National Service, Norfolk House, St. James's Square, London, S.W.1. Applications cannot be acknowledged.

STATION DESIGN. A striking example of modern British practice at the important wayside station of Luton. Reprinted from *The Railway Gazette*, July 7, 1944. Price 1s. Post free 1s. 2d.

SECTIONED PERSPECTIVE VIEW OF LOCOMOTIVE FRONT END. A notable drawing of L.M.S.R. class "7P" 4-6-2 locomotive of the latest type. Reprinted from *The Railway Gazette*, June 15, 1945. Price 2s. 6d. Post free 2s. 8d.

BRITISH WORK ON PERSIAN RAILWAYS. The achievements and difficulties of the R.E.s. during the 15 months in which they laid the foundation for effective aid to Russia. Reprinted from *The Railway Gazette*, February 2 and 16, 1945. Price 1s. Post free 1s. 2d.

during both morning and evening peak hours. These exits enable passengers to reach the Southern Railway station and the bus station in the forecourt without encountering the usual congestion in the Underground ticket hall and subway. In addition the exits at the east end of both District Line platforms via the auxiliary bridge and direct to the subway to the Southern Railway station will be kept open during all traffic hours instead of during evening peak hours only.

Portable Tools for Export.—In connection with the Government drive for greater exports, the firm of S. Wolf & Co. Ltd., maker of the well-known range of Wolf portable electric tools, is reviving and extending its pre-war export associations. Mr. R. F. Hatto, Sales Director of the company, is at present on a visit to Canada and the United States to examine and discuss the future possibilities for the sale of Wolf portable electric tools in those markets. A selection of Wolf electric tools was displayed at the recent exhibition of power-operated hand tools held at Kings Cross by the L.N.E.R. Chief Engineer's Department, and reviewed in our December 28, 1945, issue.

West Yorkshire Road Car Co. Ltd.—The report for the year ended December 31, 1945, shows net traffic receipts and other income of £402,501, compared with £494,531 in 1944. Net profit was £104,464, as against £100,919. The dividend of the 6½ per cent. cumulative preference shares for the half-year ended December 31, 1945, absorbed £6,500, and a final dividend is recommended of 5 per cent., free of income tax, on the ordinary shares, making 10 per cent. for the year, which will require £39,375. The balance carried forward of £58,964 compares with £46,250 brought in from the previous year. The reserve for contingencies being no longer required, it has been transferred to general reserve, and £50,000 is added thereto, making a total of £225,000.

Associated Electrical Industries Limited.—Trading profit of the group for 1945 was £3,336,464, and dividends and interest contributed £100,772, the total of £3,437,236 comparing with £3,446,747 in 1944. Consolidated net profit was £887,634, and after allocations to reserves and payment of dividends the carry-forward is £768,476, as against £687,933 brought in from the previous year. General and special reserves receive £413,151, compared with £357,158. The ordinary dividend is maintained at 10 per cent. Orders on the company's books now number more than three times those on hand at the beginning of 1938, and the company is undertaking a programme of expansion for which purpose the board is proposing to issue £838,050 in new shares, one new share at

50s. being offered for every £5 of stock held. The authorised capital of the company will thereby be increased from £5,161,950 to £6,000,000.

Metropolitan-Cammell Carriage & Wagon Co. Ltd.—We are asked by the Metropolitan-Cammell Carriage & Wagon Co. Ltd. to state that as a result of a mistake on the part of its advertising consultant, its advertisement on page 10 of our March 29 issue relating to the 1,250 covered and 1,250 open wagons ordered from that company for the Indian State Railways, appeared earlier than intended. The Metropolitan-Cammell Carriage & Wagon Co. Ltd. has built at the present date 2,390 of these wagons, leaving 110 covered wagons to be built to complete the contract.

Scottish Airways Summer Timetable.—Several pre-war air routes will be re-opened when the summer timetable of Scottish Airways Limited (an L.M.S.R. associate) comes into force on April 15. The Renfrew—Inverness link will be restored, and there will be a daily through service between Renfrew, Inverness, Kirkwall, and Shetland. In addition there will be a new daily non-stop service between Inverness and Shetland. The Inverness—Stornoway ferry will operate daily instead of three times weekly. Stornoway will also have direct air communication with Glasgow, and numerous other services are being increased in frequency.

R. H. & D. R. Guide and Timetable.—The restored public train service over the 15-in. gauge Romney Hythe & Dymchurch Railway is shown in an illustrated timetable guide book and souvenir published by Ian Allen Limited, 225-7, Laleham Road, Staines, price 6d. The tables give the existing service which is being run on Saturdays only until June 1, and also the daily service to be operated from that date until further notice. The guide book pages describe the railway, its equipment, and history—including its wartime accomplishments—and present an historical and scenic review of Romney Marsh, its picturesque towns, and the coastline that bounds it.

Railway Relics at the Science Museum.—Two well-known collectors, Mr. J. Phillimore and Mr. C. F. Dendy Marshall, both assembled important collections, consisting mainly of pictures, documents and medals relating to railways. Since their death, however, these collections have been dispersed, and the Science Museum and Science Library have been able to acquire many interesting items which, together with examples previously in the national collections, form a most valuable reference collection of British railway history. A special exhibition showing a selec-

tion from these recent additions will be opened at the Science Museum, South Kensington, on April 13. The fine series of early contemporary prints is perhaps the most notable feature, but there are also many valuable and unique historical documents.

Contracts and Tenders

The Tube Investments group of engineering industries announces that production has started on a contract for 5,000 tons of railway locomotive boiler tubes placed by the French Government in connection with the rehabilitation of the French State Railways. Production is being undertaken at the Tubes Limited works, Birmingham; Talbot Stead Limited works, Walsall; and Jarrow Tube Company works, Jarrow, Durham. This contract, which involves the fabrication of 260,000 precision steel tubes, is the largest of its type undertaken since the war.

Below is a list of orders placed recently by the Egyptian State Railways:—

North British Rubber Co. Ltd.: Rubber hose.

G. E. Mortley Sprague & Co. Ltd.: Armatures.

Armstrong Oiler Co. Ltd.: Oiler pads.

English Steel Corporation Limited: Springs.

Standard Telephones & Cables Limited: Transformer chokes and telegraph and telephone material.

Creed & Co. Ltd.: Teleprinters.

Thos. Hinshelwood & Co. Ltd.: Paints.

A. S. Young & Co. Ltd.: Welding materials.

Suffolk Iron Foundry (1920) Limited: Welding materials.

Haggerty Lawrence & Co. Ltd.: Welding material.

Quasi-Arc Co. Ltd.: Welding material.

Murex Welding Processes Limited: Welding material.

John Levick Limited: Nails, padlocks.

Gladholm & Robson Limited: Wire ropes, etc.

P. & W. MacLellan Limited: Mild-steel joints.

Whitecross Co. Ltd.: Wire ropes, etc.

Sentinel (Shrewsbury) Limited: Super-heater elements.

Ericsson Telephones Limited: Plug switch-board.

Arthur Balfour & Co. Ltd.: Files and saws.

Carborundum Co. Ltd.: Abrasives.

British Ropes Limited: Wire rope, etc.

Forthcoming Meetings

April 17 (Wed.).—The Institution of Railway Signal Engineers, at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, London, W.C.2. 6 p.m. "Upper Quadrant Signals," Paper by Mr. R. S. Griffiths (Past-President).

Railway Stock Market

Hopefulness as to the Budget imparted firmness to stock markets earlier in the week, which were also aided by continued strength of British Funds. Industrial shares moved higher, although best levels were not fully held, and iron and steels remained dull on nationalisation fears; but earlier declines brought in buyers for Stewarts and Lloyds, Dorman Long, Guest Keen, and Babcock & Wilcox. After easing on the unchanged 10 per cent. dividend, Vickers firmed up in expectation of the consolidated accounts and Chairman's annual statement. Higher levels ruled for North British Locomotive. Charles Roberts were good at 88s. 9d. on the new issue.

Unaffected by the Budget decisions, home rails remained a quiet section of markets, but maintained firmness, and where changed small movements were shown in junior stocks. Debentures were firm, and senior preference stocks recorded small gains, the rise in British Funds tending to influence high-class investments. The traffic figures, showing a further reduction from the abnormal wartime levels, had no influence on the stock market. This reduction was not unexpected, and incidentally it is noted that the railways are following a progressive policy in providing increased travel facilities for holiday purposes, etc. Granted a square deal on the basis proposed just before the war, and other necessary adjustments to meet increased costs, it is believed that the railways would be able to pay dividends comparing satisfactorily with those in the immediate pre-war years. It is not contended that they would reach levels ruling under the existing control agreement; last year's dividends benefited from with-

drawals from contingency reserves. On the other hand, the railways have a just claim to net revenue as defined in the 1921 Act, and assuming a new square deal to take into account the changed conditions resulting from the war, dividends might very well equal the average paid under the existing control agreement, after a transition period. Incidentally, although the fixed rental prevented stockholders from benefiting to any appreciable extent from the big wartime expansion in receipts of the railways, the control agreement is now beginning to turn to the advantage of stockholders and it is generally expected it will remain in force until the future of the railways and transport is finally decided. Nationalisation uncertainties doubtless will continue to keep home railway junior stocks on a high yield basis; but current yields would only be justified if, in the event of nationalisation, the terms to stockholders were unfair. Consequently the view is held in some quarters that there may be scope for good improvement in prices in due course. Apart from other considerations, home rail stocks are so widely held by all classes of the community that a fair compensation basis would probably be forced on the Government. Bearing in mind the cover for dividend requirements and the fact that they are cumulative as to dividend, it is thought in some quarters that L.N.E.R. first and second guaranteed should be quoted around par, and that they are undervalued in relation to L.M.S.R. guaranteed stock at 102.

Comparison with a week ago shows an improvement from 55 to 55½ in Great Western; the 5 per cent. preference remained at 111 and the 4 per cent. deben-

tures at 111½. L.M.S.R. eased from 27½ to 27½; but on the other hand, the senior preference moved up further from 76½ to 78, and the 1923 preference from 54½ to 56, and the guaranteed stock and debentures were at the same levels as a week ago. L.N.E.R. first preference stock was also favoured and improved 1½ to 55, but the second preference at 28 was unchanged on balance, and the first and second guaranteed stocks remained at 97½ and 89½ respectively. Southern deferred eased from 22½ to 22½; the preferred remained at 75 and the 5 per cent. preference at 110½. London Transport "C" developed a better tendency, improving from 56 to 56½. Metropolitan Surplus Lands shares further receded to 9s. 3d.

Argentine railway stocks attracted more attention and were higher on balance, particularly debenture stocks of the leading companies. It is realised that the future of the British-owned Argentine railways is likely to come to a head this year; but that whereas ordinary and preference stocks must be regarded speculatively, a good case can be made out for the view that in many instances debenture stocks are undervalued. Compared with a week ago, Buenos Ayres Great Southern further improved from 9½ to 10½, the 5 per cent. preference from 22½ to 24 and the 4 per cent. debentures from 61½ to 64½. Buenos Ayres & Pacific consolidated debentures were good at 59, Buenos Ayres Western 4 per cent. debentures rose to 59½ and Central Argentine 4 per cent. debentures remained at 16½, awaiting the directors' further statement, after the withdrawal of the capital scheme. Canadian Pacific at 24½ were unchanged on balance.

Traffic Table and Stock Prices of Overseas and Foreign Railways

Railways	Miles open	Week ended	Traffic for week		No. of Week	Aggregate traffic to date			Shares or Stock	Prices				
			Total this year	Inc. or dec. compared with 1944/5		Totals		Increase or decrease		Highest 1945	Lowest 1945	Apr. 9 1946		
						1945/6	1944/5							
South & Central America	Antofagasta ...	834	31.3.46	£ 39,090	+ 8,680	13	£ 436,680	£ 398,230	+	£ 38,450	Ord. Stk.	12	8½	9½
	Arg. N.E. ...	753	30.3.46	ps. 273,700	- ps. 8,000	39	ps. 11,523,300	ps. 11,555,500	-	ps. 32,200	Ord. Stk.	10	5½	5½
	Bolivar ...	174	Mar., 1946	4,909	- 521	13	14,115	16,068	-	1,953	6 p.c. Deb.	8½	17	4½
	Brazil ...										Bonds	25	5½	5½
	B.A. Pacific ...	2,771	30.3.46	ps. 2,482,000	- ps. 158,000	39	ps. 88,604,000	ps. 84,409,000	+	ps. 4,195,000	Ord. Stk.	7	5	5
	B.A.G.S. ...	5,080	30.3.46	ps. 4,561,000	+ ps. 302,000	39	ps. 138,530,000	ps. 130,993,000	+	ps. 7,597,000	Ord. Stk.	13½	10½	10
	B.A. Western ...	1,924	30.3.46	ps. 1,153,000	+ ps. 47,000	39	ps. 46,852,000	ps. 44,371,000	+	ps. 2,481,000	Ord. Stk.	12½	9½	10
	Cent. Argentine ...	3,700	30.3.46	ps. 3,407,520	+ ps. 441,970	39	ps. 123,025,677	ps. 113,148,900	+	ps. 9,876,777	Ord. Stk.	9½	7	7
	Do. ...										Dfd.	5	2½	3½
	Cent. Uruguay ...	970	30.3.46	43,144	+ 10,879	39	1,516,178	1,340,167	+	176,011	Ord. Stk.	7½	4	6½
	Costa Rica ...	262	Feb., 1946	26,912	+ 1,297	34	222,104	172,502	+	49,602	Ord. Stk.	16½	13	12½
	Dorada ...	70	Feb., 1946	28,065	+ 1,388	8	59,814	58,605	+	1,209	1 Mt. Deb.	103	102	101½
	Entre Rios ...	808	30.3.46	ps. 428,000	+ ps. 68,400	39	ps. 16,595,900	ps. 15,380,200	+	ps. 1,215,700	Ord. Stk.	7½	4½	5½
	G.W. of Brazil ...	1,030	30.3.46	29,800	+ 4,700	13	411,800	358,100	+	53,700	Ord. Stk.	30½	23½	20½
	Inter. Ctl. Amer. ...	794	Feb., 1946	\$899,699	+ \$148,466	8	\$1,924,216	\$1,482,373	+	\$441,843	Ord. Stk.	—	—	—
	La Guaira ...	22½	Mar., 1946	4,421	+ 972	12	16,850	15,910	+	940	5 p.c. Deb.	78	70	61½
	Leopoldina ...	1,918	30.3.46	56,055	+ 12,013	13	734,508	584,884	+	149,624	Ord. Stk.	4½	3½	3½
	Mexican ...	483	31.3.46	ps. 1,256,800	+ ps. 261,800	13	ps. 10,622,400	ps. 7,996,600	+	ps. 2,625,800	Ord. Stk.	4	3	1
	Midland Uruguay ...	319	Feb., 1946	12,941	+ 5,801	33	147,430	138,980	+	8,450	Ord. Sh.	75	67½	80½
	Nitrate ...	382	31.3.46	9,503	+ 1,056	12	57,202	36,225	+	20,977	Ord. Sh.	—	—	—
	N.W. of Uruguay ...	113	Feb., 1946	3,791	+ 911	32	44,609	45,207	+	598	Ord. Sh.	75	67½	80½
	Paraguay Cent. ...	274	29.3.46	£ 56,355	+ £ 3,350	39	£ 2,316,783	£ 2,355,899	+	£ 39,116	Pr. Li. Stk.	79½	77	75½
	Peru Corp. ...	1,059	Mar., 1946	118,386	+ 19,991	38	1,252,842	1,170,479	+	82,363	Pref.	108	77	9½
	Salvador ...	100	Feb., 1946	c 233,000	+ c 27,000	32	c 1,080,000	c 957,000	+	c 123,000	Ord. Stk.	60½	50½	51
	San Paulo ...	153½									Ord. Sh.	17½	10½	16½
	Taltal ...	156	Feb., 1946	5,315	+ 3,230	34	24,490	20,045	+	4,445	Ord. Sh.	—	—	—
	United of Havana ...	1,301	30.3.46	96,506	+ 14,841	39	2,104,279	2,098,614	+	5,665	Ord. Stk.	3	1	2
	Uruguay Northern ...	73	Feb., 1946	1,477	+ 436	33	14,090	12,457	+	1,633	Ord. Stk.	—	—	—
Canada	Canadian National ...	23,569	Feb., 1946	5,771,000	- 475,800	8	11,951,200	12,759,400	-	808,200	Ord. Stk.	24	14½	24½
	Canadian Pacific ...	17,037	31.3.46	1,581,600	- 266,000	13	14,232,000	14,726,400	-	494,400	Ord. Stk.	—	—	—
Various	Barsi Light† ...	202	Feb., 1946	30,465	+ 10,365	45	278,032	243,082	+	34,950	Ord. Stk.	131	123	112½
	Beira ...	204	Jan., 1946	69,229	- 8,862	16	274,482	314,277	+	39,795	Ord. Stk.	—	—	—
	Egyptian Delta ...	607	22.2.46	18,343	- 2,696	39	514,206	570,041	-	55,835	Prf. Sh.	10	8½	6
	Manila ...										B. Deb.	71	55½	70½
	Mid. of W. Australia ...	277	Feb., 1946	15,858	+ 464	32	134,118	155,340	-	21,222	Inc. Deb.	97½	85	80
	Nigeria ...	1,900	Jan., 1946	364,084	- 31,234	42	2,794,107	3,133,455	-	339,348	Ord. Stk.	—	—	—
	Rhodesia ...	2,445	Jan., 1946	491,378	- 15,492	16	2,009,946	2,068,980	-	59,034	Ord. Stk.	—	—	—
	South African ...	13,301	23.2.46	1,015,836	+ 7,532	50	47,739,779	43,734,644	+	4,005,115	Ord. Stk.	—	—	—
	Victoria ...	4,774	Nov., 1945	1,252,024	- 55,618						Ord. Stk.	—	—	—

† Receipts are calculated @ 1s. 6d. to the rupee